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ABSTRACT BOOK

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A-0001 ANTISPASMODIC AGENT LOADED SMART HYDROGEL SYSTEM FOR PREVENTION OF VASCULAR PROBLEM TO IMPROVE FLAP SURVIVAL IN RAT SKIN FLAPS

Hwan Jun Choi, Hyun Kim
Soonchunhyang University Hospital, Cheonan, South Korea

Vasospasm during reconstructive microsurgery is a common, uncertain and devastating phenomena concerning flap survival. Topical vasodilators as antispasmodic agents are widely used to reduce vasospasm and enhance microvascular anastomosis in reconstructive microsurgery.

In this study, thermo-responsive hydrogel (CNH) was fabricated by grafting chitosan and hyaluronic acid to Poly(N-isopropylacrylamide) PNIPAM where, Papaverine an anti-spasmodic agent was loaded (CNHP0.4) to evaluate rat skin flap survival. Mobility during application and injectability through small orifice that can fill spaces after surgery are the clinical advantages of thermo-responsive hydrogels. Physicochemical characteristics of grafted hydrogel and in-vitro biocompatibility of papaverine loaded hydrogels were studied.

Post-operative flap survival area and water content of rat dorsal skin flap were measured after 7 days of intradermal application of control hydrogel (CNHP0.0) and Papaverine loaded hydrogel (CNHP0.4) groups. Tissue malondialdehyde (MDA) content and superoxide dismutase (SOD) activity was estimated to determine oxidative stress in the flaps by enzyme linked immunosorbent assay (ELISA). H&E staining and immunohistochemistry (IHC) was used for evaluating flap angiogenesis and inflammatory markers. Results showed that, CNHP0.4 hydrogel could reduce tissue edema, improve flap survival area, increase SOD activity and decrease MDA content. Furthermore, it also significantly increased mean vessel density with upregulated CD34 and VEGF expression and decreased macrophage infiltration with reduced CD68 and CCR7 expression via IHC staining.

Overall, these results indicate that papaverine loaded hydrogel (CNHP0.4) possesses enhanced angiogenesis, anti-oxidative and anti-inflammatory effects which promote skin flap survival by preventing vascular spasm.

A-0002 CONTROLLED SLOW RELEASE OF VASCULAR ENDOTHELIAL GROWTH FACTOR IN ALGINATE AND HYALURONIC ACID MICROBEAD SYSTEM TO PROMOTE WOUND HEALING IN PUNCH-INDUCED WOUND RAT MODEL

Hwan Jun Choi, Hyun Kim
Soonchunhyang University Hospital, Cheonan, South Korea

Wounds with compromised vascularity and hypoxia may be healed with the additional growth factor to promote vascularity. Among the different angiogenic growthfactors, vascular endothelial growth factor (VEGF) is a crucial and important candidate.

To address this issue, a combination of two different polymers, alginate (ALG) and hyaluronic acid (HA) in 80:20 ratio composition is used to optimize the bead systemalong with the 5 IU heparin (Hep) by crosslinking into calcium chloride (CaCl2). Encapsulation of Vascular endothelial growth factor (VEGF) in the bead system shows delayedcumulative release in phosphate buffer saline (PBS).

For in vitro studies, ALG—HA/VEGF150 improves endothelial Vascular cell adhesion protein 1 (VCAM1) and endothelial nitric oxide synthase (eNOS) expression markers inCPAE cells. In vivo evaluation of the bead system shows around 68 % of wound closure 2 weeks post-implantation in 8 mm punch wound models. The treatment group showsdecreased epithelial gap between the ends of the wound and neo-epidermal regeneration.

The objective of our study is to fabricate a dual polymer bead system for wound dressing that can be degraded in 5 to 6 days; the beads could be slowly releasingVEGF growth factor and to investigate the effect of VEGF incorporation into

the bead system to improve wound healing. From clinical aspects, our bead system might be reducingpain and lowering dressing cost for the patient and convenience for the healthcare provider in future.

A-0003 SURGICAL RESULTS OF LIGAMENT RECONSTRUCTION FOR THE TREATMENT OF TRAUMATIC SCAPHOLUNATE LIGAMENT INJURY

Keiichi Murata, Daisuke Kaji, Satoko Nakao, Hiroshi Yajima
Limb Trauma Center, Nara City Hospital, Nara, Japan

Purpose: Scapholunate (SL) ligament injury is the most frequent cause of traumatic carpal instability. We report the surgical technique, clinical results, radiographic and functional evaluation of traumatic SL ligament injury.
Methods: There were 7 patients (5 males and 2 females). The mean age at surgery was 30 years (19-42 years). Five patients had dynamic stage, two had static stage as proposed by Watson. According to the modified Garcia Elias classification, there were two in stage 3, one in stage 4, and four in stage 5. The surgical methods were as follows: reconstruction using the bone-ligament-bone from the dorsal aspect of the second and third CM joint in 3 cases, reconstruction using bone-retinaculum-bone reconstruction from Lister's tubercle in one case, reconstruction using the palmaris longus tendon with interference screws in one case, and the Viegas' technique using the central part of DIC with the Blatt capsulodesis in one case. Three-ligament tenodesis (modified Garcia-Elias method) was performed in one case. After 4-6 weeks of immobilization of the wrist, range of motion training was started. The X-ray measurements, symptoms, and function were evaluated before and after the surgery
Results: The mean postoperative period was 22 months (13-28 months). The radiographic SL dissociation improved from 2.7 mm preoperatively to 1.2 mm at the final postoperative examination in AP view, and from 4 mm to 2.2 mm in Clenched fist view (PA). The SL angle was 73˚ preoperatively and 61˚ at the final postoperative examination, showing no significant difference. Grip strength ratio compared with healthy side improved from 56% preoperatively to 89% at the final postoperative examination. The modified Mayo wrist score improved from 27 to 74, DASH improved from 25 to 12, and VAS (pain) improved from 48 mm to 14 mm.
Discussion and Conclusion: There is still no consensus among the various surgical techniques currently used for SL ligament injury. In this study, we performed several types of ligament reconstruction (using bone-ligament-bone, bone-retinaculum-bone, free tendon, and the central part of the DIC, three ligament tenodesis) determining the method according to the stage of the carpal instability and obtained good results in the mid-term postoperative period. Although each surgical technique has its own tips, we believe that ligament reconstruction is a useful approach not only in the dynamic stage of SL dissection but also in the static stage.

A-0004 INDICATIONS AND PRACTICAL TECHNIQUES FOR VASCULARIZED BONE GRAFTING FOR AVASCULAR NECROSIS OF THE CARPAL BONES

Daisuke Kaji[1], Keiichi Murata[1], Kenji Kawamura[2], Hiroshi Yajima[1], Shohei Omokawa[2], Yasuhito Tanaka[2]
[1]Nara city Hospital, Nara, Japan; [2]Nara Medical University, Nara, Japan

Selection for the treatment of avascular necrosis of the carpal bones depends on the stage of progression of the diseases. We have performed vascularized bone grafting (VBG) for more than 20 years as a treatment for avascular necrosis of the carpus (mainly Kienböck's disease and Preiser's disease). In this report, we describe the indications, surgical procedures, and outcomes of this procedure.

For the patients with Kienböck disease, Lichtman's stage II and stage IIIA and B with mild segmentation of the lunate, we have used 1-2 intercompartmental supraretinacular artery (ICSRA) described by Zeidemberg et al. and Berger's 4+5 extensor compartmental artery (ECA) as a vascular pedicle from the dorsal aspect of distal radius. Additionally, temporary fixation of the scaphotrapezio-trapezoidal(STT) joint has been used for decompression to the lunate until bone remodeling by revascularization. Also, in Preiser's disease, VBG with 1-2 ICSRA has been used for the cases of Herbert's stages 1-3.
Twenty-three patients with Kienböck's disease and 4 with Preiser's disease were treated with VBG. In Kienböck's disease, five patients were Lichtman's stage II, 8 in IIIA, and 10 in IIIB. In these, 1-2 ICRSA was used in 21 cases, and 4+5 ECA in 2 cases. After curettage of the necrotic area of the lunate, VBG taken from the distal radius was inserted longitudinally in the lunate, and temporary STT joint fixation was performed in all cases. In Preiser's disease, 1-2 ICSRA was used in one patient with Herbert's stage 1 and 3 with Herbert's stage 3. VBG was harvested from the dorsal radius and inserted in the scaphoid after curettage of the necrotic area.
All patients showed improvement in modified Mayo wrist score after surgery (from 55.7 to 80.0), but the range of motion of the wrist in patients with Kienböck's disease (from 93 to 105 degrees) was less improved than that in patients with Preiser's disease (from 103 to 170 degrees). The advantage of this technique for avascular necrosis of the carpal bones is that it provides both revascularization and osseous support by grafting a vascularized bone. And there are fewer donor site morbidities and less vascular variations. This procedure is not indicated for Lichtman's stage IIIB with significant segmentation or collapse, IIIC and stage IV in Kienböck's disease, or Herbert's stage 4 in Preiser's disease. For such cases, lunate or scaphoid resection should be indicated.
For the treatment of avascular necrosis of the carpal bones, the VBG is simple, reliable procedure, and very useful when performed according to appropriate indications, although careful handling of vascular pedicle is required.

A-0005 INNOVATIVE FORCE SENSOR MEASUREMENT OF GRASP TYPES AND FORCES IN ACTIVITIES OF DAILY LIVING

Monique M Keller[1], Roline Barnes[2], Corlia Brandt[3]
[1]Universtity of the Free State, South Africa & University of the Witwatersrand, South Africa; [2]University of the Free State; [3]University of the Witwatersrand, South Africa

Hypothesis: Different grasp types generate varying forces on activities of daily living (ADLs), that may assist in the development of clinical hand rehabilitation guidelines for individuals after second to fifth metacarpal fractures.
Methods: The researcher in a prior study determined ADL tasks and divided both basic and instrumental into five sections: personal care, transportation and mobility, indoor home environment, outdoor gardening, and miscellaneous tasks, after determining the primary grasp utilized during each ADL task. The cross-sectional quantitative approach included a larger sample, recruiting 32 healthy adults aged 20 to 59 through convenience sampling. The participants engaged in testing thirty-one ADLs, each linked with a specific grasp type. For data collection, participants wore two testing gloves equipped with Flexiforce 13mm force sensing resistors (FSRs) attached to all ten fingertips (Image 1 below), enabling the measurement of forces during the performance of ADLs. Additionally, grip strength measurements were obtained using a Jamar dynamometer. The collected force data were then imported into an Excel spreadsheet for subsequent analysis. Both descriptive and inferential analyses were conducted using STATA software. Descriptive statistics were employed to summarize the demographic characteristics of the participants and the finger force measurements. Additionally, a two-sample t-test with equal variance assessed gender differences in grip strength measurements that were assessed before the force testing
Results: The study involved the participation of 14 male and 18 female individuals, with an average age of 37 years. Significant differences between genders were observed in seven specific grasp types. These included three instances of

thumb-adducted power palm grasps, three thumb-abduction precision pad grasps, and one thumb-abduction power palm grasp, all included in the testing protocol. Various ADLs, categorised as light and heavy tasks, were performed, and their corresponding grasp types were identified. No statistically significant difference ($p = 0.0958$) was calculated for gender differences in grip strength.

Summary Points:

- Hand therapists could integrate grasp types into evaluations of individuals recovering from second to fifth metacarpal fractures to identify specific functional deficits and utilize grasp force data alongside tissue healing timelines to inform a safe and timely return to functional activities.
- Integrating grasp types into isolated active joint range of motion exercises and aligning ADLs with predominant grasp types based on the stage of tissue healing may enhance overall hand function and rehabilitation outcomes.

Image 1: Testing equipment and gloves

A-0006 COMBINED DIP ARTHRODESIS WITH PIP ARTHROPLASTY OR ARTHRODESIS - TECHNICAL CONSIDERATIONS

Ruben Dukan[1], Remy Pichard[1], Zhi Yang Ng[2], Ramin Shekouhi[3], Harvey Chim[3]

[1]Hand, Upper Limb & Peripheral Nerve Surgery Service, Georges-Pompidou European Hospital (HEGP), Paris, France; [2]Department of Plastic and Reconstructive Surgery, John Radcliffe Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom; [3]Division of Plastic & Reconstructive Surgery, Department of Surgery, University of Florida, Gainesville, FL, USA

Combined distal interphalangeal joint (DIP) arthrodesis with proximal interphalangeal joint (PIP) arthroplasty or arthrodesis presents unique challenges. While less common than isolated surgery for the DIP and PIP joints, with an aging population, combined DIP and PIP procedures are an increasingly encountered occurrence. Anatomical and morphological studies have provided length and width measurement standards for the middle and distal phalanges, allowing for planning to assess compatibility of strategies. Besides reviewing anatomical studies to provide length and width guidelines for hardware placement, we will also discuss optimal hardware combinations for combined surgical intervention in the DIP and PIP joints. Conflict may exist between hardware used for the DIP arthrodesis and implants used for the PIP arthroplasty. As an example, if K wires are used for DIP arthrodesis, any intervention in the PIP joint will be compatible. However, if headless screws are used for DIP arthrodesis, these should ideally not reach proximal to the midpoint of the middle phalanx. Other techniques, such as single or multiple oblique screws and tension bands are not incompatible with PIP arthroplasty. Hence, the options for the management of the PIP joint are very dependent on the technique used for DIP arthrodesis. We will review these technical considerations and highlight case examples to guide surgical management.

A-0007 NAVIGATING COMPLEXITY: SURGICAL MANAGEMENT AND RECOVERY OF A SECOND CARPAL ROW FRACTURE-DISLOCATION

Ricardo Teixeira, Sónia Rodrigues, Pedro Chaves, Catarina Rodrigues, Raquel Marques

ULS Médio Tejo, Abrantes, Portugal

Background: This case report describes the management of a complex wrist injury in a 40-year-old male who sustained trauma from a fall while riding a hoverboard.

Methods: The patient presented with significant left wrist edema, pain, and functional impairment following the accident. Diagnosis was confirmed through imaging, revealing a second carpal row fracture along with carpal-metacarpal dislocation.

The patient underwent surgical treatment consisting of open reduction and internal fixation (ORIF) of the fractured hamate and trapezium bones, including repair of the Capitotrapezoid ligament. Additionally, provisional fixation of the third, fourth, and fifth carpal-metacarpal joints was performed

Results: Post-surgery, the patient experienced median nerve paresthesias, which progressively improved over time. At the eight-week postoperative follow-up, provisional K-wires were removed, and a rehabilitation protocol was initiated. At the three-month follow-up, the patient had a Disabilities of the Arm, Shoulder and Hand (DASH) score of 36.7, indicating moderate disability.

Conclusion: This case underscores the importance of early diagnosis and appropriate surgical management in complex wrist injuries. The patient's recovery illustrates the potential for regaining function following such traumatic injuries, provided that comprehensive postoperative care and rehabilitation are implemented. The DASH score reflects the ongoing challenges faced by the patient but also highlights the progress made since surgery.

A-0008 INTRAFOCAL PINNING FOR PROXIMAL PHALANGEAL BASE FRACTURES

Masayoshi Ikeda[1], Daisuke Nakajima[2], Yuka Kobayashi[2], Takayuki Ishii[3], Shinji Yoshida[3], Ikuo Saito[4]

[1]Shonan Central Hospital, Fujisawa, Kanagawa, Japan; [2]Tokai University Hachioji Hospital, Hachioji, Tokyo, Japan; [3]Tokai University School of Medicine, Isehara, Kanagawa, Japan; [4]Isehara Kyodo Hospital, Isehara, Kanagawa, Japan

Objective: Fractures of the proximal phalangeal base of a finger with dorsal angulation are often difficult to fix rigidly reducing the distal fragment because of the small proximal fragment and the adjacent MP joint. We have attempted early motion exercise using intrafocal pinning for this fracture, and we report on thier postoperative results.

Methods: Thirty-one patients (20 women, 11 men) with 38 fingers (2 index, 3 middle, 12 ring, and 21 little fingers) were included in the study, with 6 cases of both fractures of the ring and little fingers and 1 case of both fractures of the index and middle fingers. The fracture types were dorsal angulation deformity or lateral angulation at the base of the proximal phalanx, with 11 intra-articular and 27 extra-articular fractures. The mean age at the time of injury was 58.6 years, the mean time from injury to surgery was 7.4 days, and the mean postoperative follow-up was 7.4 months.

Surgery was performed under local anesthesia and image intensification. The fracture was reduced by traction of the distal fragment. Thin (0.7-mm) wires were percutaneously inserted from both sides of the extensor tendon proximal to the MP joint and were inserted distally from the fracture as an intrafocal pin. Postoperatively, joint motion was started immediately after surgery using buddy taping with the adjacent finger. The wires were removed one month after surgery

Results: Bone union was achieved in all cases. Mean postoperative joint range of motion was 0°/67.2° at the DIP joint, -7.2°/97.9° at the PIP joint, 0°/69.6° at the MP joint, and %TAM 89.5%. Mean radiographic measurements showed that the lateral flexion in the AP view was reduced from 12.4° preoperatively to 3.6° postoperatively, and the dorsal angulation of the fracture in the lateral view was corrected from 34.9°of dorsal angulation preoperatively to 5.3°of palmar angulation postoperatively. There was no overlapping of the fingers due to malunion. There was one pin tract infection.

Factors deteriorating the range of motion of the joint were a long time after the injury, elderly patients, and patients with concomitant injuries.

Conclusion: This technique allows for joint movement while maintaining the distal fragment in the reduced position by pressing down on the proximal phalangeal basal fragment with intrafocal pins. The presence of overlapping and alignment of the fingers can be checked during surgery by performing active finger flexion and extension.

The advantage is that postoperative active joint motion promotes self-correction of fracture alignment. The disadvantage is that some residual palmar flexion deformity or overhang deformity may occur, and the insertion of the pin into the fracture site is dependent on the surgeon's technique.

A-0009 THE ROLE OF ARTERIAL SUPPLY IN COMPLEX HAND INJURIES: SINGLE VS. DUAL ARTERIES AND THEIR IMPACT ON PERFUSION AND FUNCTION

Martynas Tamulevicius, Malte David Steinbach, Florian Bucher, Nadjib Dastagir, Doha Obed, Peter M. Vogt, Khaled Dastagir
Department of Plastic, Aesthetic, Hand and Reconstructive Surgery, Hannover Medical School, Hannover, Germany

Introduction: Complex hand injuries (CHI) pose a significant challenge in hand surgery due to severe damage, particularly neurovascular damage, which requires repair. While restoring arterial perfusion is critical, it remains unclear whether reconstructing both proper palmar digital arteries is necessary for optimal outcomes. This study evaluates whether restoring one or both arteries in CHI impacts perfusion, hand function, and quality of life.
Methods: In this retrospective, cross-sectional, follow-up study, we investigated patients with CHI admitted to a university hospital's high-volume regional hand trauma center between January 2013 and December 2020. Perfusion has been assessed using FLIR thermal imaging and laser speckle contrast analysis. Functional outcomes and quality of life scores were measured using the DASH, EQ-5D-5L, and EQ-VAS questionnaires. Sensory assessments and pain and grip strength measurements using the Jamar® hand dynamometer were also conducted.
Results: A total of 31 patients (mean age 58.97 ± 16.99 years) with devascularizing complex hand injuries were included. Thermal imaging showed a significantly higher finger surface temperature in patients with two-artery reconstruction. Laser speckle contrast analysis confirmed better perfusion, though not statistically significant. Functional and quality-of-life scores were similar across groups, except for significantly improved temperature sensation in the two-artery group
Conclusions: Reconstructing both arteries in CHI is not essential for satisfactory functional outcomes or quality of life if one artery provides sufficient perfusion. However, dual artery reconstruction may improve perfusion and temperature sensation, supporting its use when feasible.

A-0010 INPATIENT TREATMENT TRENDS IN HAND TRAUMA MANAGEMENT: A LONG-TERM IN-DEPTH ANALYSIS OF 14,414 PATIENTS AT A UNIVERSITY HAND TRAUMA CENTER

Martynas Tamulevicius, Florian Bucher, Nadjib Dastagir, Doha Obed, Peter M. Vogt, Khaled Dastagir
Department of Plastic, Aesthetic, Hand and Reconstructive Surgery, Hannover Medical School, Hannover, Germany

Introduction: Hand injuries are a leading cause of emergency department visits. Factors, including the increasing shortage of skilled personnel, the aging population, and high-cost pressures are driving a shift towards outpatient treatment in recent years. This study aimed to analyze these shifts and suggest new hand trauma management strategies and treatment paradigms.
Methods: In this retrospective cohort study, patients who presented to our hand surgical trauma center on an emergency basis between 2007 and 2022 were analyzed. The patient cohort was divided into two groups: the earlier cohort (EC) covering the period 2007–2014 and the current cohort (CC) covering the period 2015–2022. Trends in care strategies for various hand injuries over time were examined
Results: During the study period, 14,414 patients with various hand injuries presented to our emergency department. One-third of all patients were admitted for inpatient treatment of their injuries. One-third of patients were hospitalized for at least one week, one-fifth for at least two weeks, and one-tenth for three or more weeks. The rate of inpatient treatment decreased annually on average by 7%, while the rate of outpatient treatment showed an average annual increase of 5.3%. A significant trend toward outpatient treatment was observed for fractures of the metacarpal bones and fingers, burns and corrosions, lacerations, superficial injuries, dislocations, complex injuries, and infections. Additionally,

a significant increase in the duration of hospital stay was noted in the CC ($p < 0.001$).
Conclusion: The findings of this study reveal a growing trend toward outpatient treatment, reflecting a focus on efficiency without foregoing quality of care. Although fewer patients are hospitalized, those needing admission receive more extensive treatment, signaling a shift toward ambulatory care for moderately severe hand injuries. Moreover, this study emphasizes the importance of initial injury management and the increasing need for outpatient hand surgical care.

A-0011 IMPACT OF BRACHIAL PLEXUS BIRTH INJURY SEVERITY ON UPPER LIMB LENGTH DISCREPANCY

Petra Grahn[1], Patrick Willamo[2], Sanna Rautakorpi[2], Sari Marjala[2], Yrjänä Nietosvaara[1,3]
[1]Department of Pediatric Orthopedics and Traumatology, New Children's Hospital, Helsinki University Hospital, University of Helsinki, Finland; [2]Department of Rehabilitation, New Children's Hospital, Helsinki University Hospital, University of Helsinki, Finland; [3]Department of Pediatric Surgery, Kuopio University Hospital, University of Eastern Finland

Background: This study aimed to investigate the relationship between the severity of permanent brachial plexus birth injury (BPBI) and upper limb length discrepancy. BPBI is a condition resulting from nerve damage during birth, which can lead to functional and structural differences between the affected and unaffected limbs. We assessed limb length discrepancies based on the extent of BPBI and evaluated whether plexus reconstruction had an impact on final limb length.
Methods: This retrospective study included 147 patients with BPBI. Data on limb length were prospectively collected, and the severity of BPBI was classified at 1 month post-injury into four groups: Group I (C5-C6), Group II (C5-C7), Group III (C5-C8), and Group IV (C5-T1). The 3-month Toronto Test Score (3MTS) was also used to evaluate injury severity. Patients with bilateral injuries were excluded. Limb length measurements were taken at three points: from the acromion to the lateral epicondyle, from the lateral epicondyle to the wrist crease, and from the wrist crease to the tip of the third finger. We also analyzed the effect of plexus reconstruction on final limb length in Groups III and IV.
Results: The mean age at final evaluation was 13.1 years (range: 9-19 years). Limb length discrepancies varied according to the severity of the injury. Group I had an average limb length discrepancy of 2.6% (range: 0-5.9%, SD 1.9), Group II had 4.3% (range: 0-10.5%, SD 2.6), Group III had 6.8% (range: 2.0-11.6%, SD 2.6), and Group IV had the largest discrepancy at 10.9% (range: 3.1-16.0%). Patients with a 3MTS score of ≤ 3.5 had a mean limb length difference of 8.3% (range: 8.5-16.0%, SD 3.4), while those with a 3MTS score of >3.5 had a discrepancy of 3.5% (range: 0-9.8%, SD 2.4). No significant difference in final limb length was observed between patients who underwent plexus reconstruction and those who did not in Group III ($p=0.18$) or Group IV ($p=0.36$).
Conclusion: Limb length discrepancies in children with BPBI can be predicted based on the severity of the injury as early as 1 month post-injury. Although plexus reconstruction is a critical intervention for functional recovery, it did not significantly affect the final limb length discrepancy in more severe cases (Groups III and IV). Therefore, while reconstruction may improve motor outcomes, its impact on limb growth should not be overestimated.

A-0012 CASTING VS SURGICAL TREATMENT OF PEDIATRIC MEDIAL EPICONDYLE FRACTURES: A RANDOMIZED TRIAL

Petra Grahn[1], Ilkka Helenius[2,3], Tero Hämäläinen[2], Yrjana Nietosvaara[1,4], Reetta Kivisaari[5], Juha-Jaakko Sinikumpu[6], Jenni Jalkanen[4], Matti Ahonen[1]

[1]Department of Pediatric Orthopedics and Traumatology, New Children's Hospital, Helsinki University Hospital, University of Helsinki, Finland; [2]Department of Orthopaedics and Traumatology, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; [3]Department of Pediatric Surgery, Orthopaedics, and Traumatology, University of Turku and Turku University Hospital, Finland; [4]Department of Pediatric Surgery, Kuopio University Hospital, University of Eastern Finland; [5]Department of Radiology, HUS Diagnostic Center, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; [6]Department of Pediatric Surgery, Orthopaedics, and Traumatology, and Research Unit of Clinical Medicine, University of Oulu and Oulu University Hospital, Finland

Introduction: Medial humeral epicondyle fractures in children are traditionally treated with casting, while surgical fixation is increasingly utilized, despite limited high-level evidence supporting its benefits. This study aimed to evaluate whether casting is non-inferior to surgical reduction and fixation for displaced medial epicondyle fractures in pediatric patients.
Methods: A multicenter, randomized, non-inferiority clinical trial was conducted at four university hospitals. Seventy-two children aged 7-16 years with ≥2 mm displaced medial epicondyle fractures were randomly assigned to receive either casting (n=35) or surgical fixation (n=37). Baseline characteristics, including age, sex, injury mechanism, and fracture characteristics, were comparable between the groups. The primary outcome was the Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) score at 12 months, with a non-inferiority margin of 6.8 points. Secondary outcomes included the Pediatric Quality of Life Inventory (PedsQL), PedsQL Pain Questionnaire, carrying angle, grip strenth, range of motion (ROM), elbow stability, cosmetic appearance, return to sports, and rates of fracture union.
An additional observational cohort of 21 patients who declined randomization but received follow-up was also analyzed
Results: At the 12-month follow-up, the mean QuickDASH score was 1.7 in the surgery group and 2.7 in the casting group, confirming non-inferiority (mean difference: -0.98 points, 95% CI -2.95 to 0.98). The cosmetic visual analog scale (VAS) significantly favored the casting group with a difference of -8.9 points (p=0.0004). Non-union occurred in 69% of the cast-treated patients and 2.7% of the surgery group, but this did not impact functional outcomes. All 65 patients who participated in sports or music prior to injury returned to their pre-injury level, with no significant differences in the time to return between groups (median: 2 months). There were no significant differences in PedsQL, PedsQL Pain, carrying angle, grip strength, ROM, or elbow stability between groups at the final follow-up.
In the declined cohort, the mean QuickDASH score at 12 months was significantly higher in the surgery group (5.6) than in the casting group (0.9) (p=0.0035). No other significant differences were observed between surgery and casting in the declined cohort.
Conclusion: Casting without reduction was non-inferior to surgical reduction and internal fixation for displaced medial epicondyle fractures in children, with comparable functional outcomes and superior cosmetic results. The inclusion of data from the declined cohort strengthens the generalizability of the findings, demonstrating that casting remains a viable alternative to surgery for these fractures.

A-0014 LONG-TERM OUTCOMES OF PROXIMAL ROW CARPECTOMY IN PATIENTS < 45 YEARS OLD, A MINIMUM OF 10-YEAR FOLLOW-UP

Filippo Pantaleoni, Paolo Boccolari, Antonio Reitano, Alfonso Federico, Sofia Cagnolati, Sabrina Distante, Serena Maini, Davide Gravina, Andrea Acciaro Leti
University Hospital of Modena, Italy

Background and Hypothesis: Proximal row carpectomy (PRC), in a population > 45 years old, is a well-accepted surgical procedure which leads to reliable results with low complication rate, conceived to treat multiple wrist pathologies.
The age < 45 years is frequently considered a relative contraindication, it is indeed still debated if PRC can be performed in young patients because, after the operation, the anatomical incongruity of the lunate fossa and the capitate head predisposes to developing radio-capitate osteoarthritis and this process is enhanced in individuals with higher functional demands and longer life expectancy.
To our knowledge, only two papers analyze the long-term outcomes of PRC in patients < 45 years old; this study not only reports a large series but also tracks a vast number of variables.
Methods: From June 2023 to December 2023, we reviewed a retrospective cohort of patients aged < 45 years old, who underwent PRC between 2002 and 2013 in the University Hospital of Modena. Exclusion criteria were: patients < 18 years old, use of RCPI prosthesis or K wires, concomitant radius fracture, spasticity or tetraplegia, fasciotomy, Volkman syndrome, arthrogryposis. Age, sex, patient-rated wrist evaluation (PRWHE), visual analogue scale (VAS), Active Range Of Motion (AROM), grip and pinch tests were recorded and compared to the contralateral, the associations with the access (volar/dorsal), surgical indication and radiographic osteoarthritis (Culp and Jabsen grading system) were investigated using linear or logistic regression models
Results: 135 patients were included in the study, 28 were excluded, 71 were lost to follow up, 36 accepted to be enrolled in the research project and were reviewed at a mean follow-up of 15.55 years. The uninjured wrist has mean flexion 70.30° (σ12.93), extension 66.56° (σ8.65), D2 males 38.41kg (σ10.12), while the operated side has average flexion 38.72° (σ18.97), extension 46.33° (σ13.58), D2 males 25.94kg (σ11.29). Low grade osteoarthritis is detected in 7 manual and 12 non-manual workers with mean AROM 95.21° (σ19.58) and D2 27.28kg (σ12.35), while high grade osteoarthritis in 11 manual and 3 non-manual laborers with average AROM 75.00° (σ34.42) and D2 24.06kg (σ10.46). In linear regression with X=VAS, healthy wrist flexion is 0.10 and extension is 0.14 while operated wrist D2 is -0.09. PRWHE follows the same trend. With X= (AROM wrist undergone surgery/AROM contralateral wrist) and manual worker as reference, non-manual variable is 0.20.
Summary Points: The wrist, which underwent PRC, displays 67% AROM and 66% grip strength (D2) of the uninjured contralateral. Greater AROM and grip strength are related to lower grade of osteoarthritis and non-manual work however pinch strength does not follow the trend, there is no statistically significant association between pain and radiography, volar and dorsal approaches have similar results. Manual workers have almost 4 times higher risk of developing osteoarthritis and 20% AROM reduction, compared to non-manual laborers. Higher VAS is related to lower grip and pinch strength of the operated wrist but, interestingly to note, higher AROM in the healthy side.

A-0015 SURGICAL TECHNIQUES FOR SWAN NECK FINGER DEFORMITY CORRECTION

Filippo Pantaleoni, Paolo Boccolari, Gilda Sandri, Dilia Giuggioli, Andrea Acciaro Leti
University Hospital of Modena, Italy

Swan neck finger deformity is, aesthetically and functionally, an unpleasant condition characterised by hyperextension of the proximal interphalangeal joint and flexion of the distal interphalangeal joint. A mild swan neck features a clumsy start of the grasping motion whereas a severe deformity is associated with clicking and snapping when the proximal interphalangeal joint flexion is attempted. Patients often complain painful finger flexion and weak grip strength.
The presentation briefly introduces the topic by showing the anatomy, etiology, classification, clinical examination and conservative treatment. Afterwards it illustrates in detail the surgical options with multiple clinical pictures and free-hand drawings: 1) FDS-hemi-tenodesis, 2) volar plate advancement, 3) Fowler tenotomy, 4) spiral oblique retinacular ligament reconstruction, 5) lateral band relocation and 6) intrinsic release.
Each procedure is discussed separately in order to highlight the indications and contraindications, the surgical technique, the pearls and pitfalls, the recommended post-operative rehabilitation.
The aim of the talk is to provide the listeners with manifold ways to treat the swan neck finger deformity in order to be able to pick out the most suited one for each occasion.

A-0016 VOLAR PLATE FIXATION OF P2 BASE FRACTURE-DISLOCATIONS, SURGICAL TECHNIQUE AND INDICATIONS

Filippo Pantaleoni[1], Paolo Boccolari[1], Roberto Tedeschi[2], Marta Montanari[1], Danilo Donati[1], Andrea Acciaro Leti[1]
[1]University Hospital of Modena, Italy; [2]University Hospital of Bologna, Italy

Proximal interphalangeal joint (PIPJ) fractures are common and challenging injuries. These fractures often result from trauma, such as hyperextension or direct impact, leading to joint instability and impaired function. The treatment strategies for fracture-dislocations of the middle phalanx (P2) base are guided by the extent of the joint surface involvement. For lesions affecting less than 10% of the joint surface, conservative treatment is generally sufficient. For those involving 10% to 30% of the joint surface, the choice between conservative and surgical intervention depends on the specific stability of the PIPj. Lesions where the involved surface is 30% or greater most of the times require surgical intervention to restore joint function, due to the mechanical forces of the central slip and the superficial flexor tendon (FDS) displacing respectively the dorsal and volar fragments. The integrity of the volar plate and collateral ligaments are fairly critical to maintaining joint stability in such cases.
We describe in detail the surgical technique for volar plate fixation of P2 base fracture-dislocations, recommended for patients with high functional demands and indicated when the volar fragment is large (>30%) and comminuted while the dorsal side of the P2 base is still intact and a single block with the diaphyseal bone.
Under WALANT anesthesia, the PIPj volar skin is incised following a modified Bruner incision and the P2 is exposed. The volar plate is cut distally and either slip of the FDS insertion is partially detached from median to lateral. The fracture is reduced and the Medartis TriLock plate (designed for the proximal phalanx), properly bent, is fixed temporarily with K-wires and then, after X-rays check, with screws. Both hemi-FDS are sewed up to each other over the device and the volar plate is stitched to it as well in a loose manner. Active flexion is encouraged to assess the congruity of the joint and to show the full range of motion to the patient.
For 1 week, a cylindrical splint flexed 20° is worn full time to reduce postoperative edema but the patient has to remove it every 3h during the day to perform exercises and preserve flexor tendons sliding. From the 8th day, the brace is switched to a buddy-taping for other 2 weeks.

The presentation focuses the attention to the upsides and downsides of the surgical indication and technical procedure, aided by clinical pictures and radiographies.

A-0017 IMPACT OF GRASPING TECHNIQUES ON TENSILE STRENGTH OF SIX-STRAND TENDON SUTURES

Koji Moriya, Yutaka Maki, Naoto Tsubokawa, Hisao Koda, Takuma Kuroda
Niigata Hand Surgery Foundation

Hypothesis: The locking configuration of the core suture in tendon repair significantly impacts its tensile strength. We assessed the effects of various grasping techniques for six-strand core sutures on gap formation resistance and failure mode.
Methods: In total, 27 porcine flexor tendons were transected and randomly assigned to two groups. One group (n = 14) underwent repair using the Yoshizu #1 (Y1) technique, a combination of the Tsuge suture with a looped thread and the modified Kessler suture using double threads with two needles (Yoshizu needle). The other group (n = 13) underwent repair using the novel six-strand Yoshizu #3 (Y3) technique, a combination of the Yoshizu parallel suture (double threads of the Yoshizu needle placed longitudinally in a parallel fashion with two tendon-grasping parts in the Lim and Tsai technique) and the Tsuge suture with a looped thread. The repaired tendons were subjected to linear, non-cyclic load-to-failure tensile testing using a tensile testing machine. The initial clamp distance was 5 cm, and the overhead crossbar was advanced at a constant speed of 25 mm/min. A vertically mounted video camera at the tendon repair site monitored the distance between the stumps. The pulling force was recorded continuously, and the initial gap, 2-mm gap force, and ultimate strength were measured.
Results: The Y1 technique exhibited a significantly lower mean load at the initial gap (9.4 N) compared to the Y3 technique (26.8 N). Conversely, Y3 repairs demonstrated a greater average load at the 2-mm gap tensile load (38.1 N) than Y1 (22.4 N). No statistical differences were observed in the mean ultimate tensile load between the two groups (Y1: 54.2 N; Y3: 61.7 N). In total, 11 of the 14 tendons repaired using the Y1 technique failed due to knot failure, whereas the remaining ones failed due to suture rupture. Similarly, 10 of the 13 tendons repaired using the Y3 technique failed due to knot failure, and the remaining ones failed due to suture rupture.
Summary points: Our study demonstrated that the novel six-strand suture Y3 technique exhibits significantly higher mean loads at initial and 2 mm gap tensile loads compared to the six-strand Y1 technique. Furthermore, both methods demonstrated identical failure modes. Previous studies have reported that the transverse components of core sutures decrease the tensile strengths of two-, four-, and six-strand tendon repairs. Unlike the Y1 technique, the Y3 technique does not employ a transverse component at the tendon gripping site. We suggest that this structural difference contributes to the significantly higher tensile strength observed in Y3 repairs compared to Y1 repairs, despite them both being six-strand sutures.

A-0018 LACERTUS SYNDROME AND ITS SURGICAL MANAGEMENT USING WALANT - OUR FIRST 12 CASES

Daniel Morritt, Simon Yip
Norfolk and Norwich University Hospital (NNUH), Norwich, UK

Background: Lacertus syndrome is a nerve compression syndrome characterized by compression of the median nerve in the proximal forearm by the lacertus fibrosus. Common symptoms include tingling and numbness in the median nerve distribution in the hand and digits; weakness in median nerve innervated muscles (i.e. FPL; FDS2 & 3, FCR); pain in the

medial aspect of the proximal forearm. Diagnosis is made via history and physical examination, often combined with a positive scratch collapse test, although we do not routinely perform this.
Wide-awake Local Anesthesia No Tourniquet (WALANT) lacertus release involves local anaesthetic containing adrenalin to numb the area. A 3-4cm incision in the elbow crease allows access to divide the lacertus fibrosus and decompress the proximal median nerve. The syndrome and its treatment was described by Elizabet Hagert.
This review aims to increase clinician awareness of lacertus syndrome and the success of performing it under WALANT, to hopefully increase its recognition and adoption.
Methods: This is a retrospective review of data on our first twelve lacertus release patients spanning a 4 year period (2018-2022), comparing pre-op and post-op Disabilities of the Arm, Shoulder and Hand (DASH) scores to measure success post-surgical release. DASH scores were recorded pre-op and 6/52, 3/12, 6/12, 1 year post-op.
In most cases, it was performed with a carpal tunnel decompression. In one case it was performed with a cubital tunnel decompression. In another patient, it was performed with a tendon reconstruction
Results: The majority of patients had very good or good outcomes. Post-op DASH scores improved in all patients, and in some patients, there was complete resolution of symptoms at 3 months to 1 year.
One patient developed a flexor tenosynovitis which affected the outcome but this was not felt to be related to the lacertus release. Another showed signs of an ulnar nerve compression/irritability postoperatively.
Conclusion: We found WALANT lacertus release to be easy to perform and it appears to be safe with no complications. Performing under WALANT allows muscle power to be checked intraoperatively and further release performed if necessary (which would not be possible under a regional or general anaesthetic).
Lacertus syndrome is often misdiagnosed as carpal tunnel syndrome as it is less commonly known and shares similar symptoms and clinical signs. Both can occur simultaneously i.e. a double crush syndrome. Its diagnosis should always be considered in patients presenting with carpal tunnel syndrome who have reduced sensation in the palmar cutaneous branch of the median nerve; reduced power in median nerve innervated muscles (e.g. FPL; FDS2 & 3, FCR) and tenderness under the lacertus fibrosus.
Unresolved carpal tunnel syndrome symptoms post-release may indicate a missed diagnosis of lacertus syndrome.

A-0019 NORA´S DISEASE

Marta de Prado Tovar, Cristina Ortega Alvarez, Arístides Laureano D`Oleo Maldonado, Víctor de Diego Gutierrez, Patricia Paz Ramirez
Hospital Comarcal de Laredo, Laredo, Cantabria, Spain

A 69-year-old female patient present increased volume in the third finger of her left hand. The patient reports recent onset and rapid growth.
On physical examination, a tumor was observed on the palmar ulnar edge of the second phalanx of the third finger of the left hand, that limits flexion of the proximal interphalangeal joint. The tumor is hard, is not mobile and is attached to deep planes. The mass is seen on the radial edge of the fourth finger, generating skin irritation and redness. The patient reports pain with flexion of the finger and by imprint on the fourth finger.
As complementary tests, x-rays and CT scans are performed.
The x-ray showing a bone density lesion on the palmar ulnar edge of the third finger, with a rounded appearance and poor edges defined.
CT scan that identified the lesion as a bone exostosis dependent on the ulnar cortex of F2 of the third finger, approximately

15.7 x 9.5 x 6 mm in size, depending on the distal epiphysometaphyseal region and growing downwards, adjacent to the flexor tendon although without dependence on it and dorsal with respect to the neurovascular bundle. The lesion described is compatible with osteochondromatous proliferation. paraostal bizarre/Nora lesion.
Surgical intervention was decided, performing excision of the lesion that depends on the ulnar palmar aspect of the second phalanx of the 3rd finger of the hand.
left. The ulnar neurovascular bundle is located and the flexor tendon is lateralized for complete excision. Samples are sent for anatomy pathological. Through the anatomopathological study, the differential diagnosis can be made between Nora's lesion and malignant lesions of the
cartilage or parostal sarcoma, the main difference being the atypicality of the cell nucleus and cellular dedifferentiation.
The patient is followed. He has complete mobility of the finger, with adequate healing of the surgical wound and without pain. In control x-ray no traces of injury were seen and the result of the pathological anatomy reported the sample as mesenchymal proliferation with
spindle cell and myxoid areas without atypia and abundant matrix, chondral and bone, with maturation. Characteristic calcification is observed. Findings consistent with bizarre parostal osteochondromatous proliferation.
It must be taken into account that parostal and periosteal lesions of the fingers are usually benign pseudotumors, so it is important to adequate imaging study prior to the therapeutic decision to avoid excessively aggressive interventions or amputations, which may be unnecessary and generate significant functional impotence in the patient.

A-0020 BODY INTEGRITY IDENTITY DISORDER

Marta de Prado Tovar, Cristina Ortega Alvarez, Arístides Laureano D`Oleo Maldonado, Marta Fuente Alonso
Hospital Comarcal de Laredo, Laredo, Cantabria, Spain

A 21-year-old patient came to the emergency department with a injurie on the fourth finger of his right hand, in a domestic accident, according to what he reported. He had an open fracture at the level of the proximal phalanx diaphysis, section of the extensor apparatus and possible involvement of the ulnar neurovascular bundle of said finger. In the emergency room, washing, skin suturing and immobilization with a plaster splint were performed. Informed of the need for surgical revision for fracture osteosynthesis and tendon repair, the patient did not consent and proposed amputation of the finger as the only alternative.
The patient recognizes the psychological discomfort that his fourth finger has been causing him for years, which is why he consciously and premeditatedly bought a chainsaw and tried to cut off said finger, with the conviction that This way you will feel better.. The patient is diagnosed with Body Integrity Identity Disorder (BIID). Given this new discovery, what should we do? Is the patient capable of making decisions? Does your right to autonomy prevail, even if this means irreversible bodily harm?
We decided tto bring this case to the attention to the judget who presented two questions:
1. Whether the patient is capable of making decisions freely, and 2. What is the treatment indicated in this case (repair / amputation / psychotherapy / psychopharmacological treatment).
Regarding the first point, it seems to you that the patient is capable of deciding, after a psychiatric evaluation, that he does not find an altered mental state. The patient understands, reasons and decides, assuming the consequences of non-surgical intervention (she cannot undergo surgery without her consent). Regarding the second point, it seems appropriate to negotiate with the patient a time to study the case and reach the most prudent conclusion possible, and propose a treatment that has the greatest guarantees.

Next day the patient requests voluntary discharge. Since there was no autolytic ideation (understood as a desire for death) or heteroaggressiveness, he did not meet the criteria for admission against his will, so he was discharged from the hospital. A few hours later the primary care emergency service receives the notification of voluntary amputation of the finger at home. Should we have acceded to the patient's wishes, even if it went against one of the pillars of our profession: "Primum non nocere"? Would we act in the same way again if we are presented with another case with this pathology?
We shared this case to open the debate and meditate on the topic. If body integrity identity disorder is recognized as an established diagnosis, entailing that uncontrollable desire for amputation of a healthy limb, and is equated with the desire for sex reassignment surgery in cases of gender dysphoria, it could be evaluate scheduled amputation at the patient's request (Nadeau 2024). What made the decision in this case even more difficult was the patient's self-harming attitude and the lack of time to study and understand this pathology until now unknown to us.

A-0021 DOES INTRACOMPARTMENTAL SEPTUM IN THE FIRST DORSAL EXTENSOR COMPARTMENT AFFECT THE TREATMENT RESULTS OF DE QUERVAIN`S DISEASE?

Junko Sato, Yoshinori Ishii, Hideo Noguchi, Ikuko Takahashi
Ishii Orthopaedic & Rehabilitation Clinic, Gyoda, Japan

Background: Higher prevalence of septation dividing extensor pollicis brevis (EPB) and abductor pollicis longus tendons in de Quervain`s disease patients has been reported compared with that of cadavers. However, it is unknown whether the septation is a factor affecting treatment results of the disease. In this study, we retrospectively compared several factors among the groups categorized according to patients' final results.
Methods: Consecutive 234 wrists (76 men and 158 women; mean age 49.8 years, range 14–88) of 213 patients diagnosed with de Quervain`s disease during a 10-year period from 2014 to 2023 in our clinic were enrolled. Of these, 41 wrists were from 31 pregnant or lactating women. At their initial visit, we judged the presence or absence of intracompartmental septum in the first dorsal extensor compartment (FDEC) by using ultrasound. By referring to the data at the time of initial visit, we compared gender, age, body mass index, hand dominance, affected side, diabetes mellites, previous occurrence of hand tendinitis (carpal tunnel syndrome, trigger finger and/or De Quervain's syndrome), and septate FDEC between the following four pattern of two groups categorized according to more-than-one-year results; 1) wrists with and without surgery, 2) if initial corticosteroid injection was done in our clinic, wrists with additional injection or surgery and wrists without these additional treatment, and 3),4) same patterns of two groups excluding pregnant or lactating women. Steroid solution was injected into only EPB subcompartment for septate FDEC by using ultrasound. With regards to septate FDEC, comparisons were made both in patterns where incomplete distal septum were included and excluded. For the same two patterns, we also compared gender, age, body mass index, and hand dominance between the wrists with and without septation. For statistical analyses, comparisons were performed using the Student's t-test for age and body mass index. We used the Chi-square for independence test for other factors ($p<0.05$).
Results: As a result, of 138 wrists underwent initial corticosteroid injection in our clinic, 50 wrists required second one and 10 wrists went to surgery without additional injection. Ten of 15 wrists and eight of 81 wrists went to surgery after corticosteroid injection in other facility and directly without injection, respectively. Final number of the wrist having surgery was 33, including five cases through multiple corticosteroid injections. Symptom subsided in 201 wrists without surgery. Female patients tended to have additional treatment after corticosteroid injection, though it was not significant ($p=0.07$). However, it reached significance in comparison excluding pregnant and lactating women ($p=0.04$). The total prevalence rate of septate FDEC was 75.6% composed of 61.5% and 14.1% for complete and incomplete septation.

Although septate FDEC tended to appear in male and slightly younger patients ($p<0.01$), it did not show any tendency in the comparisons for treatment results.
Conclusion: Our finding implied physicians do not need to be concerned for worse result due to septate FDEC on de Quervain's disease treatment. It might be noteworthy in a clinical setting that female de Quervain's disease are relatively refractory and often have non-septate FDEC.

A-0022 TAKING A CLOSER LOOK: "EVALUATING ONLINE VIDEO CONTENT FOR REHABILITATION AFTER DISTAL RADIUS FRACTURE "

Roberta Laggner[1], Dominikus Huber[2], Timothy Hasenoehrl[3], Julia Sternik[3], Stoffer Marx Michaela[4], Rita Weber-Stallecker[5], Richard Crevenna[3], Gerhild Thalhammer[1], Stephan Heisinger[1]
[1]Department of Orthopedics and Trauma Surgery, Medical University of Vienna, Vienna, Austria; [2]Department of Internal Medicine I, Division of Clinical Oncology, Medical University of Vienna, Vienna, Austria; [3]Department of Physical Medicine, Rehabilitation and Occupational Medicine, Medical University of Vienna, Vienna, Austria; [4]Institute of Occupational Therapy, FH Campus Wien, Vienna, Austria; [5]Institute of Therapeutic and Midwifery Science, Occupational Therapy, University of Applied Sciences Krems, Krems, Austria

Background: Fractures of the distal radius are among the most common bony injuries and their frequency is constantly increasing, leading to an elevated need for subsequent rehabilitation. This growing need has led to an emergence of online content aimed at providing guidance on rehabil-itation. Nonetheless unreviewed online content raises concerns about its reliability, therefore the objective of this study was to evaluate the quality, reliability, and comprehensiveness of online videos concerning rehabilitation following a distal radius fracture.
Methods: A total of 240 YouTube videos underwent screening, identifying 33 videos meeting the inclusion criteria. These selected videos were evaluated by five independent experts from various professional groups, using the Global Quality Scale, DISCERN reliability tool, and JAMA Benchmark Score, as well as a structured set of questions to assess their comprehensiveness and coverage of pertinent aspects.
Results: The observers' assessment of the Global Quality Scale exhibited a broad spectrum of viewpoints, indicating considerable variability in evaluations. In most cases, therapy aligned well with the diagnosed condition, and most raters deemed the indication and instruction in the videos acceptable. 87% of videos were deemed suitable for home training by at least three raters. However, a concerning trend emerged as potential risks and pitfalls were scarcely addressed.
Conclusion: The moderate overall quality of the videos and the divergence in expert opinions highlight the need for a regulatory authority to ensure adherence to guidelines and maintain high-quality content. Additionally, our results raise concerns about the applicability of estab-lished assessment tools in this context.

A-0024 ARTHROSCOPIC DEBRIDEMENT FOR PISOTRIQUETRAL JOINT ARTHROPATHY THROUGH STANDARD RADIOCARPAL PORTALS OF WRIST ARTHROSCOPY

Young Keun Lee[1], Jeff Ecker[2], Ji Woong Ho[1]

[1]Department of Orthopedic Surgery, Research Institute of Clinical Medicine of Jeonbuk National University – Biomedical Research Institute of Jeonbuk National University Hospital, Jeonju, Jeonbuk, Republic of Korea; [2]Jeff Ecker Clinic, Bethesda Hospital, Claremont, Western Australia, Australia

This study aimed to report outcomes of arthroscopic synovectomy, debridement, and thermal shrinkage performed through a standard radiocarpal wrist arthroscopic portal in patients with piso-triquetral (PT) arthrosis. Medical records of 12 patients with PT joint arthrosis who were treated with diagnostic wrist arthroscopy and arthroscopic debridement between December 2019 and September 2022 were retrospectively reviewed. Functional outcome was evaluated by comparing Quick disabilities of the arm, shoulder, and hand (DASH) and visual analog scale (VAS) scores for pain (0 = no pain, 10 = worst pain) measured preoperatively and at the final follow-up visit. Average follow-up period was 25 months (range, 12 - 41 months). At the final follow-up, average VAS score (5.3 →0.3) and average Quick DASH score (36.7 →8.5) improved significantly. Arthroscopic debridement and thermal shrinkage using standard wrist arthroscopic portals are reliable treatment methods for patients with PT arthrosis who are unresponsive to conservative treatment before considering pisiformectomy.

A-0025 ACUTE BLOCKAGE OF FOREARM SUPINATION DUE TO FLAP TEAR OF THE TRIANGULAR FIBROCARTILAGE DISC

Young Keun Lee, Ji Woong Ho

Department of Orthopedic Surgery, Research Institute of Clinical Medicine of Jeonbuk National University – Biomedical Research Institute of Jeonbuk National University Hospital, Jeonju, Jeonbuk, Republic of Korea

We report a case of acute blockage of forearm supination after minor trauma and suggest a possible TFCC tear when a patient complains of forearm supination blocking.

A 22-year-old male presented with left wrist pain as the chief complaint. He was injured two months prior to pushing his left hand on the floor during exercise. Physical examination showed relative limitation of range of motion(ROM) in the left wrist of about 10° in flexion and about 15° in extension compared with the right side. The patient also complained of supination limitation and volar-side wrist pain during supination. The patient showed tenderness in the axial compression test.

Plain radiographs showing no abnormalities. MRI showed a TFCC tear in the central portion. A torn flap of the TFCC was interposed on the volar side of the DRUJ.

Arthroscopic surgery of the left wrist joint was performed. Arthroscopic examination revealed a tear in the TFCC on the radial side. A torn flap was interposed on the volar side of the DRUJ. We removed the flap from the DRUJ using an arthroscopic grasper and partially resected it. Intraoperative tests showed no locking and the forearm was well supinated. Two months after the surgery, the patient had no pain and showed full forearm supination.

DRUJ blocking due to a TFCC tear should be suspected when acute blockage of forearm supination occurs after minor trauma. MRI is helpful for diagnosis; however, we suggest that the diagnosis should be confirmed through arthroscopy. Symptoms can be resolved by surgical treatment using arthroscopy.

A-0026 EARLY FUNCTIONAL OUTCOMES AFTER OPEN RECONSTRUCTION OF TFCC

MD Michal Checinski, MPT PhD Marcin Syrko, MD Szymon Manasterski, MD Piotr Wegrzyn, MD Maja Smorag
MD Jedrzej Krolinski, MD Pawel Stajniak, MD PhD Ahmed Elsaftawy
Department of Plastic Surgery and Hand Surgery, St. Silesian Jadwiga's Hospital, Trzebnica, Poland

Background: Triangular fibrocartilage complex (TFCC) is crucial for wrist stability and function. Its injury is a common cause of an ulnar side wrist pain and/or instability of DRUJ. Surgical treatment is performed when non-operative treatment is insufficient. This study analyzes results of open surgical treatment of TFCC injuries with functional assessment of recovery between 6-18 months after surgery.
Methods: The study included 17 patients (9 male, 8 female, average age 38 y.o.) who underwent open surgery due to TFCC injury with instability of DRUJ between Feb 2022 and Jan 2024 at the hospital in Trzebnica. With a dorsal approach and the usage of trans-osseous long-absorbable suture 2-0, the procedure took ca. 51 min. Patients were discharged the next day. First, the forced supination cast was used for 3 weeks, afterwards, for the next 3 weeks the forearm was immobilized in the neutral position. 7 weeks later, the rehabilitation was implemented. 6 - 18 months after the surgery, the functional assessment was performed with the DASH protocole, the measurement of range of motion and the grip strength
Results: Patients have presented a DASH score from 1.66 to 59.16 - average 14.69. Grip force - 92.38% compared to non-operated limbs. There was no reoperation needed, no complications appeared.
Conclusion: There was observed a significant post-surgery increase of the range of motion and the grip strength. All patients returned to work and to amateur sports. Open surgical treatment is an effective and safe procedure for patients with TFCC damage for whom conservative treatment has failed.

A-0027 PERIPROSTHETIC CARPOMETACARPAL ARTHROPLASTY FRACTURE: SUCCESFUL MANAGEMENT WITH OSTEOSYNTHESIS

Laura Rey- Fernández, Marta Cuenca Llavall, Claudia Sala Sardans, Jordi Saus Sarrias
Althaia Universitary Hospital, Manresa, Barcelona, Spain

Periprosthetic fractures surrounding first carpometacarpal (CMC) arthroplasties primarily involve the trapezium and typically occur intraoperatively or perioperatively.
To our knowledge, we present the first reported case of an open periprosthetic CMC fracture affecting the metacarpal bone. We describe a 66-year-old male who underwent bilateral CMC arthroplasties, achieving excellent outcomes with the right performed in March 2019 and the left in February 2020. In August 2021, he sustained a 5 cm wound to the dorsal aspect of his right first metacarpal due to a radial saw injury.
Radiographic examination revealed an open periprosthetic fracture in the distal third of the first metacarpal. Following our institution's protocol for open fractures, he received antibiotic prophylaxis with cefazolin and gentamicin, along with extensive irrigation in the emergency department. Surgical intervention by a specialized hand surgeon revealed injuries to the extensor pollicis longus, extensor pollicis brevis, abductor pollicis longus, and first dorsal interossei. Tendon repair was performed using a 4-0 synthetic absorbable monofilament suture, and stable osteosynthesis was achieved with a 2.4 mm plate. The hand was immobilized in a splint for four weeks.
Post-splinting assessment showed stable arthroplasty and maintained carpometacarpal flexion. Three years postoperatively, the patient exhibited excellent functional outcomes: QuickDASH score of 29%, bilateral pinch strength of 28 kg, bilateral abduction of 50º, and grip strength of 49 kg in the right hand and 45 kg in the left hand.

According to the unified classification of periprosthetic fractures, this case is categorized as UCPF III.7 (metacarpals), C (distal to the implant). Periprosthetic CMC fractures are rare, with the majority documented cases involving the trapezium and occurring intraoperatively. This case highlights that management of a periprosthetic fracture without component loosening can be effectively addressed through osteosynthesis, yielding favorable functional results.

A-0028 A VALIDATION STUDY OF A NOVEL METACARPAL SIMULATOR: THE NEXT STEP IN HAND FRACTURE FIXATION TRAINING

Leo Gundle[1], Robert Gregson[2], Alfred Owens[2], Holly Sheldon Wilson[3], Melanie Moffat[2], Shakeel Rahman[1]
[1]Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom; [2]University of Bristol, Bristol, United Kingdom; [3]University of Southampton Medical School, Southampton, United Kingdom

Background: Standard metacarpal training simulators consist of homogenous plastic, and lack the cortico-medullary differentiation which provides the tactical feedback necessary for (a) drilling and (b) to enable kirshner wire insertion and intramedullary device training. We aim to develop a new training tool to address these limitations and improve the quality of hand fracture fixation training nationally. We further aspired to creat a device which avoids sending single-use simulators to landfill, the fate of many surgical simulators.

Method: We used a stereolithography 3D printer to generate the hollow metacarpal cortex. Open source models of the right third metacarpal were used. Using computer aided design software (Blender), these models were hollowed and remeshed to improve their resolution using a geometry-node-based workflow. A cortical thickness of 2.00 mm was selected, based on early manufacturability considerations, with metacarpal bones reportedly having cortical thickness of 1.14-1.98 mm. Medullas were then injection-filled with plaster of paris. To our knowledge this is the first hand fracure simulator developed using such methods.

Simulators were tested by registrar and consultant colleagues across three UK centres (North Bristol, Royal Free London, and East and North Hertfordshire NHS Trusts). Feedback on fidelity of metacarpals was collected using a five-point Likert scale questionnaire.

Results: All hand surgeons agreed that our cortico-medullary differentiated simulators would enhance surgical training. On average our simulators scored 76% for replicating tactile feedback when drilling, with 100% agreement that it was at least as good as control devices. Testers agreed that our simulators showed potential for intramedullary device and Kirschner-wire training.

Furthermore, we have collaborated with an upcycling firm, who have agreed to take our used simulators and turn these plastics into building material.

Conclusion: Our simulators prove to be a high-quality advancement in hand fracture fixation training whilst concurrently reducing the environmental impact of this essential practice.

A-0029 EARLY DIAGNOSIS OF CARDIAC AMYLOIDOSIS IN PATIENTS PRESENTING WITH BILATERAL CARPAL TUNNEL SYNDROME

Julia Schwarz[1], Max J. Biondi[2], William Rathbone[3], Hannah F. Bensimhon[2], Vincent D. Pellegrini Jr[1], Cynthia Taub[4], Lance G. Warhold[1]

[1]Department of Orthopedic Surgery, Dartmouth-Hitchcock Medical Center, Geisel School of Medicine, Lebanon, NH, USA; [2]Heart and Vascular Center, Section of Cardiovascular Medicine, Dartmouth-Hitchcock Medical Center, Geisel School of Medicine, Lebanon, NH, USA; [3]Geisel School of Medicine at Dartmouth, Hanover, NH, USA; [4]Department of Medicine, SUNY Upstate Medical University, Syracuse, NY, USA

Introduction: Carpal tunnel syndrome (CTS) is most common peripheral focal neuropathy in the general population (prevalence of 1–5%). It is most commonly idiopathic but can be caused by amyloidosis, a devastating disease that most commonly is not diagnosed until heart failure develops. CTS is a common finding among patients with cardiac amyloidosis (CA), especially if it is bilateral carpal tunnel syndrome (BCTS) (38–48% of patients with wild-type transthyretin amyloidosis, and 8–13% of patients with light chain-related amyloidosis). In 20–25% of cases of CA, CTS is the initial manifestation of the disease making it an important early marker to identify patients before or early in the cardiac involvement of amyloidosis. Currently available therapies halt progression of, rather than reverse, the disease. Retrospective analyses have shown that >10% of tissue specimens obtained during prior carpal tunnel release (CTR) have positive Congo red staining. However, the clinical impact of sending tissue specimens following CTR for routine histopathological assessment with subsequent cardiology follow-up has not been well-evaluated.

Methods: This prospective, single center study aims to characterize a novel protocol for screening BCTS patients for CA. All consecutive women >60 and men >50 years-old with BCTS undergoing CTR from 11/01/2022-12/31/2023 underwent intraprocedural biopsy. Specimens underwent Congo red staining. Positive specimens underwent genetic testing with mass spectrometry. Patients with transthyretin amyloidosis (ATTR) are then referred to cardiology for B-type natriuretic peptide and troponin labs as well as echocardiogram and technetium pyrophosphate (Tc-PYP) scan. ATTR-CA-positive patients were started on tafamidus, a newly FDA approved treatment for ATTR amyloidosis. All biopsy-positive patients without evidence of CA were started on yearly cardiac evaluation. The study was approved by the Dartmouth Health Institutional Review Board (#02001851).

Results: Of 50 patients included in the analysis, 14 (28%) had positive tenosynovial biopsies and 3 (21%) declined further evaluation. The mean (range) age was 74 years (60 – 84), 50% were female, and 29% had comorbid spinal stenosis. All patients (100%) had negative amyloid light chain screening. Of the 3 (21%) PYP scan-positive patients: all were asymptomatic; 2 (66%) had normal echocardiograms, and all ATTR-CA patients were started on tafamidus.

Conclusion: Our screening protocol identified 28% of patients undergoing CTR with positive biopsies, of whom 21% had unrecognized ATTR-CA. This represents an opportunity for timely initiation of therapy. Future studies will need to characterize the natural history of the disease with early intervention. Orthopedic surgeons treating CTS have the opportunity to identify amyloidosis early in its natural history. Orthopaedic surgeons need to be educated about the importance of testing for amyloidosis and work with cardiology closely to facilitate appropriate work up and treatment.

A-0030 REFERENCE VALUES FOR REVISED AND STANDARDIZED DELLON'S MODIFICATION OF MOBERG PICK-UP TEST WITH INTER-RATER RELIABILITY

Marisa Nikkonen[1], Kaarina Pirilä[2]
[1]Villa Manus Oy, Vantaa, Finland; [2]Metropolia University of Applied Sciences, Helsinki, Finland

Background: Functional sensory testing was introduced by Erik Moberg and in the 1980's A. Lee Dellon developed a version with standardized test items known as Dellon-modified Moberg pick-up test (DMMPUT). For modern day use this test was lacking standardized test protocol and it was not commercially available. Therefore test, with items in USA measurements, was challenging to assembly by therapist. With the kind permission of Dr. Dellon detailed standardized instructions and protocol with items of metric system were written 2013. Our aim was to have an implementable and portable everyday tool for the health sector. Peer reviews and pilot study showed that therapists perceived this test as practical, quick and easy to use for measuring dexterity and functional sensory (2015).
Purpose: Our first interest in this research was to develop further the test, to cover inter-rater reliability as validity and reliability of assessment tools is of great importance. Second aim was to collect normative data for reference values for healthy subjects age from 20 to 71 and above in Finland.
Methods: For inter-rater reliability total of 45 test subjects were included. The standardized procedure was used and each subject repeated test three times, once with each of three different raters. The data was analysed by using ICC statistics. In the second part data was collected from healthy subjects (N=624). Performance time in picking-up items and identifying them without vision, was measured and results were classified according to age, gender and dexterity
Results: In this Pick-up 3 -research the ICC reliability was considered good (0.86), almost excellent. It was also found out that person picked up the items quicker when repeating the test from the first rater to second and to third rater. This finding was statistically significant. According to previous studies shorter waiting time between the measurements may have greater learning effects. In this research all three measurements were carried out during one day.
When measuring normative values of the picking up and identifying times, some interesting results were found. There was statistically significant difference in performance time between genders. Also, the older the participant was the slower he/she was. When picking test was carried out twice it was noticed that the second test time was quicker. There was statistically significant difference between the first and second test times
Conclusions: It was found out that the third version of Dellon-modified Moberg pick-up test has very good interrater reliability. According to the findings (ICC value) of this study the test is suitable for research and clinical use. Full normative results of healthy Finnish subjects (N=624), from 20 to 71 years and above, are presented.
Assessment, Dexterity, Sensory, Nerve, Recovery, Research

A-0031 SURGERY AND BOTULINUMTOXIN INJECTIONS FOR SPASTICITY AFTER CEREBROVASCULAR DISEASE- A REGISTER STUDY OF 110,000 TREATMENTS IN SWEDEN BETWEEN 2010 AND 2021

Joakim Strömberg[1,2], Anette Chemnitz[3], Izabela Blaszczyk[4], Marcus Sagerfors[5]
[1]University of Gothenburg, Sahlgrenska Academy, Department of Clinical Sciences, Gothenburg, Sweden; [2]Department of Surgery and Orthopedics, Alingsås lasarett, Alingsås, Sweden; [3]HandCenter, Atleva Specialist care, Malmö, Sweden; [4]Department of Diagnostics and Intervention, Hand and Plastic Surgery, Umeå University, Sweden; [5]Department of Orthopedics and Hand Surgery, Faculty of Medicine and Health, Örebro University, Sweden

Objective: The aim of this register study was to investigate demographic aspects of surgical interventions and Botulinumtoxin (BoNT) injections in Swedish patients with spasticity after cerebrovascular disease over a twelve-year

period. The secondary aims were to investigate the frequence of different surgical procedures, the use of ultrasound in BoNT injections and if surgery could reduce the need for botulinumtoxin injections in adult patients with spasticity.
Methods: The Swedish National Patient Register (NPR) includes all in-patient care and outpatient doctor visits including day surgery from both private and public caregivers since 2001. The NPR also records all clinical and surgical procedures in accordance with the Swedish Classification of Care Procedures (SCCP).
After approval by the Swedish Ethical Review Authority, we conducted a register study in which all adult patients with ICD diagnosis of stroke and late effects of other cerebrovascular disease (G81.1-I69.8) who had had BoNT injections or upper extremity spasticity surgery according to SCCP during the period 2010-2021 were identified.
Results: This register study identified a total of 110,419 visits by 6,258 patients who had undergone treatment with either BoNT injections and/or spasticity reducing surgery between 2010 and 2021. The mean age was 58 (± 15.9), and 59% were male. All patients had spasticity due to late effects of cerebrovascular disease, and 1,223 patients (19.5%) had undergone spasticity-reducing surgery. The most common surgical intervention in the upper extremity was tenotomy (32%) followed by tendon lengthening (29%), excision of bone (18%) and arthrodesis (16%). Tendon transfers were uncommon. The ulnar nerve was the nerve most commonly undergoing neurectomy(6%). Patients who had undergone spasticity reducing surgery and who had had BT injections both before and after surgery (n=865), had a significantly lower number of BoNT injections per year after surgery (0.87 injections/year) compared to before surgery (1.5 injections/ year, p<.001). Ultrasound-assisted BoNT injections increased during the study period from one percent in 2015 to 30 percent in 2021
Conclusions: The results of this study describe the frequency of different surgical interventions in the upper extremity and demographic aspects of both BoNT injections and surgery. Furthermore, this study strongly indicates that spasticity surgery significantly reduces the need for BoNT injections in adult patients with post-stroke spasticity, and that ultrasound-assisted BoNT injections have increased annually since 2015.

A-0032 PATIENT RECOVERY AND USE OF ANALGESICS DURING THE FIRST THREE MONTHS AFTER DISTAL RADIUS FRACTURE- A PROSPECTIVE PARALLEL GROUP STUDY IN 173 PATIENTS

Joakim Strömberg[1,2], Johanna Lundin[2], Eva Andersson[3], Elisabet Hagren[4], Ingrid Andreasson[1,5]
[1]University of Gothenburg, Sahlgrenska Academy, Department of Clinical Sciences, Gothenburg, Sweden; [2]Department of Surgery, Orthopaedics, Alingsås lasarett, Alingsås, Sweden; [3]Department of Occupational Therapy, Alingsås lasarett, Alingsås, Sweden; [4]Department of Occupational Therapy, Kungälvs sjukhus, Kungälv, Sweden; [5]Department of Occupational Therapy, Physiotherapy, Sahlgrenska University Hospital, Mölndal, Sweden

Objective: Fracture of the distal radius is common, but the evidence regarding the patient experienced recovery and the use of analgesics during the first three months is scarce. The objective of this study was to investigate week-by-week recovery as measured by the Patient-Reported Wrist Evaluation (PRWE) form and the day-by-day use of analgesics, and to compare these outcomes between surgically and non-surgically treated patients.
Methods: This is a prospective parallel group study with daily patient registration of intake of analgesics, and weekly PRWE records during the first three months (91 days) after fracture of the distal radius. Two hundred fifty-nine patients were enrolled and 173 (67%) completed the forms: 111 who underwent open reduction and internal fixation (ORIF) with volar plating and 50 who received non-operative treatment with a cast for four weeks. Patients in both groups were included between January 2023 and February 2024.
Results: There were no significant differences in week-by-week PRWE scores between the groups at any time, but patients in the ORIF group reported higher PRWE scores during the first three months after a radius fracture. However, there was

a significant reduction of total PRWE from one week to the other in both groups throughout the study period ($p<0.05$ as calculated by Mann-Whitney test) The mean total PRWE was 71 in the ORIF group and 61 in the non-operated group at week one, and 15 and 12 at three months, respectively. The largest differences between the groups were found at one (10) and four (8) weeks, which may be due to postoperative pain during the first week and to the removal of the cast in the non-operated group at four weeks, but were still not significant. Patients in the ORIF group used Paracetamol longer, with a mean number of days until the last dose of 30 compared to 23 in the non-operated group. However, the weekly doses of Paracetamol were only significantly higher in the ORIF group during the first two weeks (mean total dose per week: 15.1 vs 8.1 g and 8.1 vs 5 g). For Oxycodone (5 mg), the mean number of days until the last dose was 6 in the ORIF group and 2 in the non-operated group, and the weekly doses were only significantly higher during the first two weeks (4.9 vs 0.9 tablets and 1.1 vs 0.1 tablets)

Conclusions: The preliminary results of this study could not detect any significant difference in patient reported recovery as reported by PRWE between the two groups at any time during the follow-up, and the graphical improvement in function seems to be linear in both groups. The use of paracetamol and oxycodone was significantly higher in the ORIF group but only during the first two weeks. This study provides novel detailed information on the recovery of function and use of analgesics in patients with this common fracture.

A-0033 CUBITAL TUNNEL SYNDROME CAUSED BY INTRANEURAL GANGLION CYST: CASE REPORT AND REVIEW OF LITERATURE

Yeongchang Lee[1], Hoiyoung Kwon[1], Junho Park[1], Hongje Kang[1], Hyuntak Kang[2]

[1]Department of Orthopedic Surgery, School of Medicine, Wonkwang University Hospital, Iksan, Korea; [2]Department of Orthopedic Surgery, National Health Insurance Service Ilsan Hospital, Goyang, Korea

Cubital tunnel syndrome is a second most common peripheral nerve compression syndrome. The causes of cubital tunnel syndrome are idiopathic but it can be caused by trauma, bone deformity and space occupying lesions like a tumor. Ganglion cyst is a relatively common cause of cubital tunnel syndrome. However, the cubital tunnel syndrome caused by intraneural ganglion cyst has been rarely reported. The authors experienced 3 cubital tunnel syndrome cases of intraneural ganglion cyst. Therefore, we report the cases with literature review

A-0034 PLATE OSTEOSYNTHESIS FOR TREATMENT OF SEGMENTAL DIAPHYSEAL FOREARM FRACTURES

Yeongchang Lee[1], Hoiyoung Kwon[1], Junho Park[1], Hongje Kang[1], Hyuntak Kang[2]

[1]Department of Orthopedic Surgery, School of Medicine, Wonkwang University Hospital, Iksan, Korea; [2]Department of Orthopedic Surgery, National Health Insurance Service Ilsan Hospital, Goyang, Korea

Segmental fractures often result from high-energy or indirect trauma that causes bending or torsional forces with axial loading. We evaluated surgical outcomes of the Plate osteosynthesis for treatment of segmental diaphyseal forearm fractures in adults.

From 2014 to 2023, We retrospectively analyzed 327 cases of adult diaphyseal forearm fractures. Of these, 30 patients who underwent plate osteosynthesis for segmental diaphyseal fractures were included. The mean age was 56.6 years, and there were 19 males and 11 females. Clinical outcomes were measured using the range of motion and Grace and Eversmann criteria, and radiological outcomes were assessed using the time to bone union.

The average range of rotational motion was 75 degrees of supination and 78 degrees of pronation. The Grace and Eversmann evaluation criteria showed excellent in 21 cases, good in 5 cases and acceptable in 4 cases. The average bone union time was 16.7 weeks. There was no major complication such as infection or nonunion.
Plate osteosynthesis for the treatment of adult forearm diaphyseal segmental fractures has achieved good clinical and radiological results.

A-0035 TREATMENT OF SCAPHOLUNATE ADVANCED COLLAPSE BY A 3D MODELLED SCAPHOID PROSTHESIS

Marius Kemler
Dept of Plastic Surgery, Martini Hospital, Groningen, the Netherlands

A male patient in his 50s presented with severe bilateral wrist pain. As a professional cyclist, he had encountered several falls. By now, he could only cycle if he wore a wrist brace. Wrist radiographs demonstrated bilateral SLAC wrists. Because he was still an active athlete, salvage techniques that all lead to wrist shortening and therefore decrease in strength, did not appeal to him. In search of a suitable solution, we tried to preserve the wrist length by replacing the collapsed and arthritic scaphoids by 3D printed titanium versions. We had had positive experiences with this procedure in a patient with a destroyed scaphoid. Three years after the operation on the left side and two years after treating the right side, the patient had significant pain reduction, good wrist function and grip strength. Final X-rays demonstrated no signs of dislocation of the implant or signs of periprosthetic arthritis. Studies have shown that once SLAC occurs, treatment should consist of either a proximal row carpectomy or scaphoidectomy and four corner fusion. In our case, despite collapse, replacement of the scaphoids by 3D modelled protheses lead to good return of function.

A-0036 BIOMECHANICAL TEST OF A NOVEL OSTEOSYNTHESIS IN METACARPAL FRACTURES DURING REHABILITATION EXERCISES

Tatjana Pastor[1,2], Gordian Banzer[1], Guillaume Pat-Lafitte[3], Jérôme Schlatter[1], Mehar Dhillon[1], Daniel J. Hutchinson[4], Michael Malkoch[4], Peter Varga[1], Peter Schwarzenberg[1]
[1]AO Research Institute Davos, Davos, Switzerland; [2]Department for Plastic and Hand Surgery, Inselspital University Hospital Bern, University of Bern, Bern, Switzerland, Switzerland; [3]Mines Saint-Etienne, Univ Jean Monnet, INSERM, UMR 1059 Sainbiose, Saint-Etienne, France; [4]Department of Fibre and Polymer Technology, KTH Royal Institute of Technology, Stockholm, Sweden

Background: Metal plates used for metacarpal fracture fixation often lead to tendon adhesions and thus to an impairment in movement of the injured finger. The newly developed osteosynthesis material (AdhFix) could help avoiding tendon adhesions, but has not been tested biomechanically in the metacarpal. Study aim: to investigate the biomechanical potential of AdhFix used for fixation of metacarpal comminuted shaft fractures in a human cadaveric model.
Methods: The second, third, and fourth metacarpals in five cadaveric hands were instrumented using four stainless-steel cortical screws and a polyether ether ketone (PEEK) plate for treatment of an unstable metacarpal shaft fracture simulated by means of a 3mm osteotomy gap. A custom 3D printed cutting and drilling guide assured accurate osteotomy cuts and screw placement. The hand was stabilized in a supine position, and each digit's flexor digitorum profundus (FDP) tendon was extracted and connected to an electrodynamic testing apparatus (Acumen, MTS) via a steel cable. Postoperative rehabilitation exercises after metacarpal fracture treatment were replicated by pulling each tendon until the fingertip met the palm in its flexion. Then, repeating the procedure with the flexor carpi radialis (FCR) and ulnaris (FCU) tendon,

the wrist was flexed with 100 N force. Each test was repeated 5 times. The bending of the PEEK plate was tracked with a stereographic camera system (Aramis SRX, GOM). Finite element modeling (FEM) was employed to calculate the internal bending moment acting in the PEEK plate's midline during full finger or wrist flexion. Finally, AdhFix was applied after removal of the PEEK plate and the tests were repeated.
Results: The maximum internal bending moments acting on the osteosynthesis were 6.14 ± 2.03 Nmm for fingertip to palm and 3.37 ± 1.64 Nmm for wrist flexion exercises as calculated by FEM. The AdhFix fixations on the metacarpal bone demonstrated resilience during the simulated non-load bearing rehabilitation exercises with no failures
Conclusions: This biomechanical investigation combined with a subsequent finite element analysis, imparts a profound understanding of internal loads acting in fixations of metacarpal bone fractures during non-weight bearing postoperative rehabilitation exercises, which AdhFix can withstand. Further evaluation is necessary before AdhFix can be applied in clinical practice.

A-0037 ECTOPIC BANKING AND IMPLANTATION OF AN AMPUTATED HAND: A CASE REPORT

Omid Liaghat[1], Zohre Shabbooie[2]
[1]Shafa Yaheeyan Orthopedic Center, Iran University of Medical Sciences, Tehran, Iran; [2]Medical Journalism Department, Shiraz university of medical sciences, Shiraz, Iran

Ectopic banking is techniques and indications for banking of amputated parts of the body for using in future replantation; because immediate replantation is sometimes impossible due to different reasons such as hemodynamic instability, loss of soft tissue, and wide contamination of the amputated part. The first case of temporary ectopic banking of hand implantation was reported in 2015 by Xu Zhang in China which was not completely successful. The first replantation was reported almost 54 years ago, followed by a limited number of similar cases that were not successful. Xu could not restore useful function of the replanted hand. Our report describes a case of hand replantation by banking technique using right ankle as recipient site. The difference between our study and Xu's is restoring useful function of amputated part and evaluating the function with standard tests. Knowing the outcome of the approach helps and ensures the researchers and surgeons to decide if they intend to use this method.

A-0038 INFLAMMATORY AND DEGENERATIVE CHANGES OF EXTENSOR POLLICIS LONGUS MUSCLE AFTER TENDON RUPTURES CAUSED BY DISTAL RADIUS FRACTURES

Christos Ni Sarigiannis[1,2], Michael Ullman[2,3], Ingrid Andreasson[2,4], Anders Oldfors[5,6], Anders Björkman[1,2]
[1]Department of Hand Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden; [2]Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden; [3]Department of Orthopaedics, Sahlgrenska University Hospital, Gothenburg, Sweden; [4]Department of Occupational Therapy and Physiotherapy, Sahlgrenska University Hospital, Gothenburg, Sweden; [5]Department of Pathology, Sahlgrenska University Hospital, Gothenburg, Sweden; [6]Institute of Biomedicine, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden

Background: Rupture of extensor pollicis longus tendon (EPL) is a known complication following a distal radius fracture (DRF). Although the precise mechanisms behind these ruptures remain unclear, vascular impairment is thought to play a significant role. Additionally, the histological impact of an EPL rupture on the tendon and muscle is not well understood, but such information could be important in guiding treatment strategies. This study aims to explore the histopathological changes in the EPL tendon and muscle in patients who have experienced an EPL rupture following a DRF.

Methods: Consecutive patients with an EPL rupture following a DRF were included and treated with an Extensor Indicis Proprius to EPL tendon transfer. Samples were taken from the distal part of EPL muscle and the proximal tendon from the musculotendinous junction to the rupture site as well as from the tendon distal to the rupture. Fresh frozen muscle specimens were analysed by enzyme- and immuno-histochemistry on cryostat sections using standard protocols for muscle pathology. The tendon specimens were analysed by standard histopathological techniques including immunohistochemistry
Results: Thirteen patients (12 females, 1 male; median age 61, range 18-72 years) were included in the study. The EPL muscle in all participants showed extensive inflammatory changes, muscle fiber necrosis and regeneration, structural changes in the muscle fibers and slight interstitial fibrosis. The EPL tendon showed profound degenerative changes mainly in the central part of the tendon whereas there were regenerative changed in the periphery of the tendon. The pathological changes were present in all samples regardless of time between the DRF and the EPL rupture or the time between the diagnosis of the rupture and surgery
Conclusions: The extensive inflammatory changes in the EPL muscle indicate that immune mediated mechanisms are involved in muscle degeneration following tendon rupture. The EPL tendon showed characteristic degenerative changes both at the myotendinous junction and at the rupture site indicating an ischemic injury. The reversibility and the clinical significance of the severe pathological changes seen in the EPL muscle alongside the healing potential of the tendon need further investigation.

A-0039 ASSESSING THE IMPACT OF THE COVID-19 PANDEMIC ON PATIENT TREATMENT AND OUTCOMES IN CLOSED METACARPAL SHAFT AND BASE FRACTURES AT THE HFR FRIBOURG

Sophie Burtscher, Joseph M. Schwab, Julien Galley, Thomas Mészáros
HFR Fribourg, Cantonal Hospital of Fribourg, Villars-sur-Glâne, Switzerland

Metacarpal fractures are prevalent hand injuries that significantly impact quality of life and healthcare resources, particularly among young, economically active individuals. Surgical intervention is recommended for fractures with rotational deformity or intraarticular step formation. However, there is less consensus regarding the management fractures showing shortening or angulation without rotational deformity. Due to lack of operative resources during the COVID-19 pandemic, our center shifted toward conservative treatment for closed metacarpal fractures without rotational deformity, regardless of radiological features. This change prompted an evaluation of clinical outcomes, which appeared favorable, as well as an evaluation of healthcare costs to have an better view on the overall value of conservative management compared to surgical intervention.
This study aims to:

1. Compare the ratio of conservatively versus surgically treated metacarpal shaft and base fractures at the Cantonal Hospital of Fribourg before (pre-COVID) and since (post-COVID) the onset of the COVID-19 pandemic.
2. compare the clinical and functional outcomes of these fractures treated in both periods
3. Evaluate the impact of conservative treatment on healthcare costs and the overall value of treatment

Methods: This retrospective study included 75 patients with metacarpal fractures, divided into two groups based on treatment periods. The Pre-COVID group (n=19) comprised patients treated from January 2016 to February 2020, while the Post-COVID group (n=56) included patients treated from March 2020 to December 2023. Clinical follow-up assessed the range of motion in the metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints, along with grip strength. Functional outcomes were evaluated using the Disabilities of the Arm, Shoulder, and Hand (DASH) and the Michigan Hand Outcomes Questionnaire (MHQ). Healthcare costs related to treatment were analyzed through

billing statements, and work absence duration was calculated from patient records
Results: From January 2016 to February 2020, 79% of patients underwent surgical treatment, while 21% received conservative care. After the onset of the COVID-19 pandemic, the treatment distribution shifted significantly, with 70% receiving conservative treatment and 30% undergoing surgery ($p<0.001$). The range of motion in metacarpophalangeal joints showed no statistically significant differences between the groups, and DASH scores indicated no significant difference in upper extremity function ($p=0.2$). However, MHQ results revealed significantly better functional outcomes ($p=0.045$) and less pain ($p=0.015$) in the Post-COVID group. Conservative treatment was associated with significantly lower costs compared to surgical treatment ($p<0.001$). Additionally, patients who underwent conservative treatment had significantly shorter work absences, leading to lower indirect costs ($p=0.029$). These findings should be interpreted cautiously due to potential limitations related to sample size
Conclusions: During the COVID-19 pandemic, there was a confirmed shift toward conservative treatment for metacarpal shaft and base fractures without rotational deformity, regardless of radiological features. The significant reduction in surgical interventions did not compromise clinical outcomes. Conservative treatment markedly decreased both direct and indirect costs, enabling patients to return to work sooner. These findings suggest that conservative treatment represents a valuable approach to optimizing healthcare resource utilization while maintaining high-quality patient care for metacarpal fractures. Further research with a larger patient population could help support and strengthen our findings.

A-0040 LONG-TERM FOLLOW-UP AFTER PROXIMAL POLE RECONSTRUCTION OF THE SCAPHOID USING OSTEOCHONDRAL GRAFTS FROM THE FEMORAL TROCHLEA

Christian M Windhofer[1,2], Patrik Ivusits[1], Josef Schauer[3], Heinz Bürger[4]
[1]Trauma Department, Unfallkrankenhaus Salzburg, Austria; [2]Ludwig-Boltzmann-Institut for experimental and clinical traumatology, Vienna, Austria; [3]Trauma Department, General-Hospital Salzburg, Austria; [4]Privat Hospital Maria Hilf, Klagenfurt, Austria

Introduction: Reconstruction of the proximal pole of the scaphoid is still a big challenge in hand surgery. If the avascular pole is still not fragmented or totally sclerotic, it is possible to adjust the length and the deformity of the scaphoid, using vascularized bone flaps from the femoral condyle, the iliac crest or the radius. In case of fragmented or totally sclerotic avascular proximal pole till now there is the osteochondral flap from the medial or lateral femoral trochlea (MFT, LFT) published. Beside these procedures there are only view possibilities known: transfer of the proximal hamate, transfer of rip cartilage and pyro Carbone implants.
We want to present our long-term results using MFT and LFT in our institution from 2009 on.
Methods: From 2009 to 2023 we operated 37 patients with avascular necrosis of proximal pole of the scaphoid (AVN). 36 could be included in this follow-up investigation. The median age at the time of operation was 34.3 years and the median follow-up was 112 months (29-150 months). Data collection was done preoperative and postoperative up to 14 years after reconstruction. Radiologic investigation was done by x-ray, CT-scan and contrast-agent MRI preoperatively and CT-scan postoperatively. Investigation included measuring of grip-strength, ROM, S-L and radio-lunate angle and Stage of AVN. Subjective criteria have also been collected like pain on VAS, Quick-DASH, Modified MAYO-Wrist-Score and IKDC-Score of the donor-site at the knee.
Because of incomplete data, one patient has been excluded from the study (n=36).
Results: For fixing the osteochondral graft we used head compression screws in most cases, additional k-wires in four and K-wires alone in 8 patients. In one case we used a Medartis® scaphoid plate.
Bony healing was found in all patients, two needed extracorporal shockwave therapy after 10 weeks additionally. Median follow-up period was 112 months.

S-L angle changed from 50,8° preop to 46,16° postop, the radio-lunate angle from 17,3° to 17,0°. Most of the patients could go back to the former job. Reduction of pain was significantly as well as functional improvement in ROM and grip-strength. Donor site was uneventful in nearly all patients, documented by sufficient IKDC-Score.
Conclusion: Our results confirm that MFT and LFT are reliable alternatives for reconstruction of the proximal scaphoid pole in case of AVN also after long-term follow-up. We could find satisfied functional outcome of the wrist in most patients with significant pain reduction. In the follow-up period we found no increase of pain or decrease of function, X-rays showed no osteoarthritic changes during follow-up, so we think these results should be constant over years.
So, we think these complex and time-consuming microsurgical procedures seem justified in patients with AVN of the proximal pole of the scaphoid.

A-0041 LONGTERM FOLLOW-UP AFTER LUNATE RECONSTRUCTION USING OSTEO-CHONDRAL GRAFTS FROM MEDIAL AND LATERAL FEMORAL TROCHLEA

Christian M Windhofer[1,2], Josef Schauer[3], Christoph Hirnsperger[1], Heinz Bürger[4]
[1]Trauma Department, AUVA Unfallkrankenhaus Salzburg, Austria; [2]Ludwig-Boltzmann-Institute for experimental and clinical traumatology, Vienna, Austria; [3]Trauma Department, General Hospital Salzburg, Austria; [4]Hospital Maria-Hilf, Klagenfurt, Austria

Introduction: Cause of Kienböck`s disease is still not clear, so the approaches of surgical treatment are versatile. In our opinion vascularization is the central problem of the lunate. Because of this we use the vascularized osteochondral grafts from the medial and lateral femoral trochlea (MFT and LFT) since many years for this indication. Aim of this procedure is to reconstruct the most time damaged proximal articular surface of the lunate and to revascularize the bone. Short- and midterm investigations have been published with good results.
Now we want to present the results of the patients operated in our institution started in 2011.
Methods: Between 2011 and 2023 we used free osteochondral grafts from the femoral trochlea in 28 patients to reconstruct the lunate in case of Kienböck`s disease. There have been 11 women and 17 men affected with a median age of 35.3 years. Data collection was done preoperative and postoperative up to 12 years after reconstruction. Radiologic investigation was done by x-ray, CT-scan and contrast-agent MRI preoperatively and CT-scan postoperatively. Investigation included measuring of grip-strength, ROM, Carpal-Height-Ratio and Lichtman stage. Subjective criteria have also been collected like pain on VAS, Quick-DASH, Modified MAYO-Wrist-Score and IKDC-Score of the donor-site at the knee.
Because of incomplete data, three patients have been excluded from the study (n=25)
Results: The median follow-up at the time of investigation was 6.21 years up to 13 years. Median preoperative time of discomfort was 5.43 months. In 68% the dominant wrist was involved. 56% of the patients stated nicotine abuse preoperatively. We found a negative ulna variance preoperative in 48%, but five of the other patients had a radial shortening procedure with ongoing symptoms befor MFT or LFT. The median time of operation was 5.43 hours, we used in 80% of the cases a dorsal approach to the lunate. The patients reported subjectively a significant improvement compared to preoperative in 76% and a significant reduction of pain from 6.36 to 1.96 on exertion. Grip-strength was reduced compared to the contralateral side with 35.64 kg to 43.76 kg on average.
Most complications like non-union or resorption of the graft was seen in Lichtman-stage IIIC and IV. In patients with Lichtman-stage II to IIIB we found uneventful healing in most cases with no significant functional difference compared to the unaffected wrist
Conclusions: Analyzing these results, we think osteochondral grafts from MFT and LFT can enable successful long-term results after lunate reconstruction in patients with Kienböck`s disease in stage II to IIIB. In patients with stage IIIC and IV there is a considerable risk of complications, so we think salvage procedures should be considered in such cases.

A-0042 SINGLE VERSUS DOUBLE BALL INTERPOSITION ARTHROPLASTY WITH TRAPEZIECTOMY FOR BASAL THUMB ARTHRITIS; RETROSPECTIVE RADIOLOGICAL OUTCOME FOLLOW UP

Kasidej Jongchanathavorn, Veeranon Chunyawongsak, Kittiwan Supichyangur
Hand and Reconstructive Microsurgery Unit, Department of Orthopedic Surgery, Rajavithi Hospital, College of Medicine, Rangsit University, Bangkok, Thailand

Introduction: Carpometacarpal (CMC) joint or Trapeziometacarpal (TMC) joint is the second most common site of hand osteoarthritis. Following trapeziectomy, ligament reconstruction with tendon interposition (LRTI) is considered a "gold standard" treatment. Currently, there is no objective radiographic study to determine whether single ball (SB) or double ball (DB) flexor carpi radialis (FCR), under ligament reconstruction with tendon interposition, whichever is more effective against atrophy of metacarpal bone of thumb.
Materials and Methods: This study is a retrospective review of 20 patients (10 SB, 10 DB) interposition with FCR ligament reconstruction that had at least 1 year of radiographic follow-up following thumb CMC arthroplasty. Posteroanterior radiographs at timepoint were evaluated for actual preoperative height of the trapezial void (HT1) vs height of the trapezial void at 1 year (HT2), preoperative first metacarpal subluxation (MS1) vs first metacarpal subluxation at 1 year (MS2), as well as preoperative first metacarpal migration (MM1) vs first metacarpal migration at 1 year (MM2).
Results: Patients undergoing DB interposition with FCR ligament reconstruction had significantly improved for height of the trapezial void at 1 year (HT2) (mean difference -2.98 [-5.22 to -0.74], $P < 0.05$). However, there were no significant differences for first metacarpal subluxation at 1 year (MS2) (mean difference -0.6 [-3.45 to 2.25], $P = 0.663$) as well as first metacarpal migration at 1 year (MM2) (mean difference 2.80 [-1.43 to 7.02], $P = 0.181$)
Conclusions: Thumb basal joint arthritis performed with a DB interposition with FCR ligament reconstruction versus SB interposition yielded short-term improved height of the trapezial void, and no difference in first metacarpal subluxation and first metacarpal migration.
Keywords: thumb basal joint, arthritis, ligament reconstruction, tendon interposition, ball, single, double

A-0043 COMPARATIVE CLINICAL OUTCOMES BETWEEN TRANSVERSE, OBLIQUE AND LONGITUDINAL APPROACH IN A1 PULLEY RELEASE FOR TRIGGER FINGER; A RANDOMIZED CONTROLLED TRIAL STUDY

Veeranon Chunyawongsak, Chayanin Pipattanaworrakul, Nuttapol Khajonvittayakul, Pornprom Srisakorn, Kittiwan Supichyangur
Hand and Reconstructive Microsurgery Unit, Department of Orthopedic Surgery, Rajavithi Hospital, College of Medicine, Rangsit University, Bangkok, Thailand

Introduction: Trigger finger, characterized by painful catching or locking of the affected digit, is commonly treated with surgical intervention when conservative measures fail. The optimal surgical approach for A1 pulley release in trigger finger remains a topic of considerable debate, particularly regarding postoperative rehabilitation and scar tissue formation. Various skin incision techniques have been proposed for this procedure, each with potential benefits and drawbacks.
Materials and Methods: This study aims to compare the outcomes of three distinct incision techniques: transverse (Tr), oblique (Ob), and longitudinal (Lo). We enrolled 39 patients, each with one trigger finger, and randomly assigned them to one of the three groups. Our focus includes key postoperative outcomes such as the range of motion of the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints, Disability of the Arm, Shoulder, and Hand (DASH) scores, and Visual Analogue Scale (VAS) scores. These measures were recorded at two time points: 2 weeks and

3 months postoperatively. Additionally, we assessed operative times and scar area formation using quantitative ultrasound measurements to provide a comprehensive evaluation of each technique's effectiveness and impact on recovery.
Results: At 2 weeks, significant differences were observed in the range of motion of both the MCP and PIP joints between the groups. The Tr group demonstrated a notably greater arc of motion compared to both the Ob and Lo groups. There were also significant differences in VAS scores, with the Ob group achieving notably better scores than both the Lo and Tr groups. Similarly, DASH scores varied significantly among the groups: the Ob group had superior scores compared to the Lo and Tr groups, with the Lo group exhibiting the poorest scores overall.
At 3 months, there were no significant differences in the range of motion for the PIP and MCP joints, nor in the VAS and DASH scores among the groups. However, there was a significant difference in operative times, with the Ob group demonstrating notably shorter times compared to the Lo and Tr groups. Additionally, no significant differences were observed in scar area formation between the groups.
Conclusions: The Tr incision results in earlier improvement in the range of motion for both the MCP and PIP joints during the early rehabilitation phase. The Ob incision, on the other hand, significantly reduces pain and enhances hand function more quickly. However, no significant differences were observed between the techniques in the long-term follow-up period.
Keywords: A1 pulley release, trigger finger, incision type, range of motion, DASH, VAS, scar area

A-0044 BARIATRIC SURGERY IS ASSOCIATED WITH LOWER INCIDENCE OF CARPAL TUNNEL SYNDROME

Tal Frenkel Rutenberg[1], Lihi Godny[1], Ran Rutenberg[1], Assaf Kadar[2], Sigal Frishman[1], Sorin Daniel Iordache[1]
[1]Rabin Medical Center (Beilinson Campus) Petah Tikva, Israel, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel; [2]St. Joseph's Health Care London, ON, Canada, Western University, London, ON, Canada

Background: Obesity is related with increased risk for carpal tunnel syndrome (CTS). The effect of bariatric surgery (BS) on the incidence of nerve entrapments is undetermined. We aimed to evaluate the incidence of CTS following BS in a large cohort study.
Methods: A retrospective cohort study of patients with obesity who underwent BS was conducted. The incidence of CTS in the five-years pre-and-post BS was compared. Patients who developed CTS following BS were compared to those who did not.
Results: Six-thousand, one-hundred and twenty-four patients met the inclusion criteria. The average age was 41.2 (SD12.9) years, most were female (68.6%). The average pre-operative BMI was 42.9 (SD5.4). Most patients underwent restrictive surgery. The incidence of CTS at the 5-years prior to the BS was significantly higher than the post BS incidence, 8.4% versus 5.1% respectively ($p<0.001$) despite the aging of the cohort. Patients who developed CTS following the BS were older and had a higher prevalence of hypertension and diabetes mellitus prior to the BS. They had a higher BMI and excess body weight at every time point measured and a lower BMI reduction. Weight regain was not associated with increased incidence of CTS. Finally, a direct correlation between excess weight loss to greater reduction in the incidence of CTS was noted
Conclusions: BS was found to be associated with reduced incidence of developing CTS. There is a dose-response association where greater weight loss following BS is protective of developing CTS.

A-0045 CAN DERMOFASCIECTOMY FOR DUPUYTREN'S DISEASE BE PERFORMED SAFELY AND EFFECTIVELY UNDER LOCAL ANAESTHETIC WITH ADRENALINE?

Richard Goodall, Maria Chicco, Luke Geoghegan, Mark Pickford
Queen Victoria Hospital, East Grinstead, UK

Purpose: Wide awake local anaesthetic no tourniquet (WALANT) surgery is well suited to dermofasciectomy for Dupuytren's as it permits active assessment of the central slip after disease excision; however, it is seldom performed. This study has two main aims: firstly, to describe our technique for dermofasciectomy under WALANT and, secondly, to compare outcomes with dermofasciectomy performed under regional anaesthesia (RA).
Methods: This retrospective cohort study included all patients treated with dermofasciectomy by the senior author in a single centre between April 2020 and April 2024. Outcome data on disease characteristics, peri-operative complications (e.g. digital nerve/artery injury, digit loss, graft loss, cardio-respiratory complications related to anaesthesia); and long-term complications (disease recurrence, revisional surgery) were compared between WALANT and RA groups
Results: 81 digits in 61 patients underwent dermofasciectomy over the 5-year study period. 42 digits in 32 patients had dermofasciectomy under WALANT, and 39 digits in 29 patients under RA. There were no significant differences in rates of digital nerve or artery injury, graft loss, post-operative infection, total surgical time or need for further surgery. In the WALANT group, no operation required conversion to general or regional anaesthesia, all patients went home on the same day as surgery and there were no local anaesthesia related complications (e.g. anaesthetic toxicity or digital ischaemia from local anaesthetic with adrenaline)
Conclusions: Dermofasciectomy can be safely and effectively performed under WALANT and should be considered as the preferred anaesthetic, with defined benefits, especially in primary dermofasciectomy and for patients with comorbidities, in whom the risks of general or regional anaesthesia are higher. Our complication rates were not significantly different from cases performed under regional anaesthetic with tourniquet control, and graft take was excellent.

A-0046 ENHANCING HAND SURGERY EDUCATION WITH AI: A USABILITY STUDY AMONG JUNIOR SURGEONS AND EXPERT FEEDBACK

Usama Farghaly Omar, Tong Pei Yein, Aaron Koh Eu Wen, Vaikunthan Rajaratnam
KTPH Singapore

Background: The Hand Surgery Companion is an AI-based educational tool developed to enhance the learning experience of medical students and junior doctors in the field of hand surgery. As AI continues to influence medical education, evaluating the effectiveness, utility, and usability of such tools is essential, particularly in specialized areas like surgery.
Objective: This study aims to assess the utility and usability of the Hand Surgery Companion through feedback from expert hand surgeons and junior doctors. The focus is on its effectiveness as a learning resource and its ease of use for junior surgeons.
Methods: Five expert hand surgeons and 30 junior doctors (postgraduate year 1–3) participated in the study over a 4-week period. Both qualitative and quantitative data were collected through surveys, interviews, and focus groups. Expert surgeons evaluated the tool for clinical accuracy, while junior doctors assessed its impact on their learning, ease of use, and overall satisfaction
Results: The Hand Surgery Companion was generally well-received by both expert surgeons and junior doctors. Experts found the tool to be clinically accurate, and junior doctors reported that it enhanced their understanding of hand surgery. Participants expressed high satisfaction with the platform, highlighting its user-friendly interface, effective educational approach, and the benefits of its personalized learning experience. Some suggestions were made for expanding content and offering more advanced case scenarios.

Conclusion: The Hand Surgery Companion demonstrates significant potential as an effective and user-friendly tool for teaching hand surgery. It is well-suited for junior surgeons, offering accurate content and an engaging learning experience. Further development could focus on expanding content depth to support a broader range of learners.
Keywords: AI in medical education, hand surgery, usability study, junior surgeons, surgical education, personalized learning.

A-0047 BUILDING SUSTAINABLE SURGICAL CAPACITY IN CAMBODIA: A DESIGN THINKING APPROACH TO BPI SKILL DEVELOPMENT

Vaikunthan Rajaratnam[1], Andrew Yam[2], Wee-Leon Lam[2], Jim Gollogy[3]
[1]KTPH, Singapore; [2]SGH, Singapore; [3]CSC, Cambodia

Over the past 11 years, our efforts in surgical volunteerism have focused on building sustainable surgical capacity in Cambodia through curriculum development, resource creation, and skill development. Using a Design Thinking framework, we developed and deployed a tailored curriculum aimed at advancing surgical skills among healthcare professionals in Cambodia. This curriculum was designed to address specific needs in the local context for brachial plexus injuries, ensuring relevance and applicability. The learning resources were hosted on an online Learning Management System (LMS), making them accessible to a wide audience of local practitioners.
Our approach also emphasized practical skills development through mentorship, using Direct Observation of Procedural Skills (DOPS) as a central component of both learning and assessment. The surgical team consisted of experienced nerve surgeons from Singapore and the UK, while local surgeons were supported by the local NGO hospital, which allowed for continuity of training. Visiting surgeons conducted DOPS evaluations to provide constructive feedback, enabling a hands-on learning experience for Cambodian surgeons. Case discussions and mentorship sessions further reinforced learning and ensured that the skills gained were well integrated into clinical practice.
The use of a Design Thinking methodology allowed us to empathize with local needs, prototype relevant solutions, and iteratively refine the curriculum and resources. The combination of accessible online resources, in-person mentorship, and direct assessment through DOPS has proven effective in improving surgical skills and ensuring sustainability in the local healthcare environment.

A-0048 CONTRALATERAL C7 NERVE TRANSFER FOR HEMIPLEGIA SECONDARY TO HEAD INJURY: A REPORT OF TWO CASES

Vaikunthan Rajaratnam[1], Andrew Yam[2], Robert Yap[2], Jim Gollogy[3], Dominic Power[4]
[1]KTPH, Singapore; [2]SGH, Singapore; [3]CSC, Cambodia; [4]UHB NHS FT, UK

Background: Hemiplegia and upper-limb spasticity following head injury pose significant challenges in rehabilitation. Contralateral C7 nerve transfer has emerged as a promising surgical technique to restore motor function in patients with chronic paralysis. This report presents our experience with two cases of contralateral C7 transfer for hemiplegia secondary to traumatic brain injury.
Methods: Two patients with persistent hemiplegia and spasticity post-head injury underwent contralateral C7 nerve transfer. Pre-operative assessment included the Modified Ashworth Scale (MAS) for spasticity, motor function evaluations, and baseline neurological examinations. Post-operative evaluations were conducted to assess motor recovery, spasticity, and donor site morbidity, with follow-up at regular intervals for six months
Results: Immediate post-operative outcomes revealed a global reduction in spasticity on the affected side, which was

sustained over six months. Both patients experienced minimal hypoaesthesia in the donor limb, which gradually normalised without long-term complications. Interestingly, both cases demonstrated an incidental improvement in speech quality immediately post-operatively, with this improvement persisting throughout the six-month review period. Despite these positive outcomes, spasticity persisted in both patients, though at reduced levels.
Conclusion: Contralateral C7 nerve transfer appears to provide beneficial effects in reducing spasticity and improving motor function in patients with hemiplegia secondary to head injury. An unexpected yet significant finding was the improvement in speech quality, suggesting further avenues for investigation into the broader neurological impacts of this procedure. Long-term follow-up is needed to fully evaluate the durability of these benefits and the ongoing management of residual spasticity.

A-0049 A NEW CLASSIFICATION OF FINGERTIP AMPUTATION: CONSIDERATION FOR FLAP RECONSTRUCTION

Satoko Nakao[1], Daisuke Kaji[1], Hayato Maekawa[2], Keiichi Murata[1], Hiroshi Yajima[1], Shohei Omokawa[3], Yasuhito Tanaka[4]
[1]Nara City Hospital, Nara, Japan; [2]Minami-Nara General Medical Center, Nara, Japan; [3]Department of Hand Surgery, Nara Medical University, Nara, Japan; [4]Department of Orthopaedic Surgery, Nara Medical University, Nara, Japan

Fingertip injuries are relatively common among hand disorders. Appropriate treatment is necessary for complete fingertip amputation and injuries with tissue loss from the point of view of a cosmetics and functions. Replantation is actively selected for fingertip amputation, and its good results are well known. However, there're various treatment options other than replantation. In this study, we set ourselves the goal of developing a protocol to determine the treatment strategy and devised a new classification for this purpose. In addition, we have conducted a retrospective study to classify our previous cases of reconstruction with flap for fingertip amputations, as we hope that this will enable us to predict complications.
The new classification included with fingertip amputations in Tamai zone1. The cases were classified into Type 1: Transverse, Type 2: Lateral oblique, Type 3: Dorsal oblique and Type 4: Volar oblique, and further subdivided into Grade A to C according to the severity of injury. [Grade A: no bone loss (no or little bone exposure), C: damage or loss of the nail matrix, B: intermediate between Grade A and C.] Only in Type 4 Cases, we defined as follows, Grade B: defect length on the volar side not exceeding 15 mm in the long axis, Grade C: exceeding 15mm.
This retrospective study included 34 fingers of 32 patients who underwent flap reconstruction for Tamai zone 1 fingertip amputations between April 2016 and June 2023 at our hospital and affiliated hospitals. All patients had complete amputation, and 31 fingers were primary reconstructed with artery flap because of difficulty in replantation or loss of peripheral tissues, and 3 fingers were secondary reconstructed with artery flap because of failure of fingertip replantation. The mean age of the patients was 54 years (23-75 years), 26 were males and 6 were females, and the affected fingers were 3 thumbs, 11 index, 12 middle fingers, 7 ring and 1 little finger, with a mean follow-up period of 6.2 months (3-14 months). V-Y advancement flap was performed on 2 fingers, oblique triangular advancement flap on 22 fingers, graft on flap on 6 fingers and retrograde finger artery insular flap on 4 fingers. The main complications at the latest follow-up were severe nail deformity in five fingers and limited extension of the PIP joint in three fingers, and additional osteotomy of the distal phalanx was performed in three fingers. No significant correlation was found between gender, age, affected fingers and the present classification or complications. A statistically significant correlation was found between severity (Grade) and complications (Grade A: 0%, Grade B: 35%, Grade C: 47%) ($p<0.05$).
Our new classification is simple and considering the type of flap to be selected for reconstruction, and should be useful for making treatment decisions in daily practice.

A-0050 PARSONAGE TURNER-SYNDROME

Martti Vastamäki
Scientific Institute Orton, Helsinki, Finland

Parsonage Turner syndrome (PTS), also known as neuralgic amyotrophy or idiopathic brachial plexus neuropathy, presents with subacute-onset multifocal painful neurogenic injury of the brachial plexus and individual nerves of the upper limb and shoulder, followed by profound muscle weakness in the distribution of one or more upper-extremity nerves including the phrenic nerve. Although its etiology is debated, there is evidence to support an immune-mediated cause. Until a few years ago, the general opinion, even among experts, was that there is no effective curative treatment for PTS, and especially no surgical treatment.

No we know that magnetic resonance imaging can show multifocal T2 nerve and muscle hyperintensities with nerve hourglass swellings and constrictions are identifiable also by ultrasound. Nowadays we know that the patients with chronic PTS can regain increased electrical and clinically important muscle function from focused microneurolysis at constriction sites identified on imaging compared with those managed nonsurgically.

The purpose of this presentation is to introduce Parsonage Turner syndrome to all hand surgeons and especially to emphasize the fact that microsurgery can help the patient. I myself operated on my first PTS patient 25 years ago. At that time, I didn't know it was PTS. The indication for surgery was Frohse arcade compression, but an hour-glass constriction was found and the patient improved.

I have treated hundreds of serratus palsies. Now I know that the vast majority of them have been PTS cases. Now I also know that these can also be successfully treated surgically, if it has been possible to find the point of constriction with an MRI or ultrasound.

Now I also know why out of over a hundred cases of compression of the suprascapular nerve that I have operated on, every tenth one has not recovered. I have operated on those cases at the wrong place, i.e. at the supra- or infrascapular notch. It is now known that the correct point is 5 cm more proximal and can be verified with imaging studies.

I also know why some of the more than 600 TOS patients I have operated on have suffered after surgery from serratus or diaphragmatic palsy or an unexplained chronic pain condition after an apparently successful operation, the cause of which has been PTS provoked by the operation.

With advanced imaging methods, Parsonage Turner syndrome has taken on a whole new meaning. It can now be effectively treated with microsurgical methods.

A-0051 3D-GUIDED VASCULARIZED FIBULA FLAP TECHNIQUE FOR CHRONIC OSTEOMYELITIS TREATMENT IN THE RADIUS

Laura Rey Fernández[1], Inma Puig de la Bellacasa de Delás[2], Martí Bernaus Johnson[2], Margarita Veloso Durán[2], Lluis Font Vizcarra[3]
[1]Hand and Elbow Unit - Althaia University Hospital, Manresa, Barcelona, Spain; [2]Hand and Bone and Joint Infection Unit-Terrassa Universitary Hospital, Barcelona, Spain; [3]Bone and Joint Infection Unit - Moisés Broggi Hospital, Barcelona, Spain

We present the case of a young patient with chronic grade IV osteomyelitis of the right radius treated with a vascularized fibula flap.

We present a 30-year-old patient with stiffness in the right wrist and a cutaneous fistula in the right forearm.

He reports a motorcycle accident 8 years ago with a multifragmentary fracture of the right radius and ulna, treated with

open reduction and internal fixation using two plates in 2014 in Venezuela. He was subsequently operated on multiple occasions for persistent wound drainage and had the plate on the ulna removed. Onset of the fistula was on March 2018. The patient smokes 10 cigarettes a day and denies other illnesses.

On physical examination, the right forearm shows two productive fistulas at the dorsal scar of the radius. He does not report pain. The joint range of motion is: pronation -15º, supination -25º, full elbow range, flexion -10º, full extension. X-rays show two plates in the distal diaphysis of the right radius with bone rarefaction.

He visits the Bone and Joint Infection Unit and Plastic Surgery outpatient clinic at our institution. A magnetic resonance imaging (MRI) and single photon emission computed tomography scan are performed. The MRI locates the fistula between the flexor carpi radialis, pronator teres, and brachioradialis. The diagnostic is grade IV osteomyelitis affecting 12 cm of the radius. Resection and reconstruction with a vascularized fibula flap are proposed. Smoking cessation is advised.

Surgery was performed on February 2023 using an extended Henry approach, removing the diaphyseal plates of the radius and lateral side, performing fistulectomy, and taking samples for microbiological cultures. Resection of the radius was done using 3D-printed guides, excising a total of 12 cm in the right radius. A vascularized left fibula flap with a cutaneous island was created, stabilized with a custom plate with three proximal and three distal screws. The donor skin was closed with a partial skin graft from the left thigh.

Broad-spectrum antibiotic treatment was initiated with Teicoplanin, Rifampicin, and Amikacin. Cultures were positive for Methicillin Resistant Staphylococcus aureus, leading to targeted antibiotic therapy with Sulfamethoxazole/Trimethoprim 1600/320 mg every 12 hours orally. He initially did not flex his right thumb.

The patient is asymptomatic, has no pain, rides a motorcycle, and resumes normal life. The cutaneous island shows good vascular trophism. There are no sensory or motor deficits. Laboratory controls show no elevation of acute phase reactants. X-rays reveal early consolidation of the proximal osteotomy site and consolidation of the distal focus, with no signs of screw or plate loosening.

Chronic osteomyelitis requires multidisciplinary management. The vascularized fibula flap is suitable for treating osteomyelitis in the upper extremity.

The authors declare no conflicts of interest.

A-0052 MASSON'S TUMOR AND ITS DIFFERENTIALS: GANGLION CYST, HEMANGIOMA, ANGIOSARCOMA. A COMPREHENSIVE CASE REPORT

Laura Rey-Fernández[1], Juan Manuel García Barrionuevo[2] , Alejandro Congo, Inma Puig de la Bellacasa Delás[2]

[1]Althaia Universitary Hospital, Manresa, Barcelona, Spain; [2]Mutua de Terrassa Universitary Hospital, Terrassa, Barcelona, Spain

Intravascular papillary endothelial hyperplasia was first described by Masson in 1923. Its importance lies in its clinical, radiological, and histological resemblance to other tumors.

It is an uncommon benign vascular lesion, accounting for 2% of all soft tissue tumors, located in the extremities, especially the hand, head, and neck. It is predominant between the third and fourth decades of life.

There are three forms: a primary or intravascular form that develops de novo in dilated blood vessels (56%), typically veins; a mixed secondary form (40%) that arises from pre-existing varicose veins, aneurysms, hemangiomas, or arteriovenous malformations; and a rare extravascular form (4%) that develops from hematomas.

Histologically, it shows endothelial proliferation in small caliber vessels, endothelial cells embedded in stroma, and papillary proliferation. The main differential diagnosis is angiosarcoma, which presents local invasion, necrosis, cellular atypia, and high mitotic activity.

Surgical excision is curative, recurrence being infrequent (7-10%). There is a lack of consensus on resection margins; a 2 mm margin is usually sufficient.
We present a 48-year-old man who presented with a painless tumor in the subcutaneous tissue of the volar wrist joint, adjacent to the radial artery.
Magnetic resonance imaging with gadolinium revealed a heterogeneous mass with isointense signal on T1 and hyperintense signal on T2, showing heterogeneous enhancement post-contrast.
The radiological differential diagnosis includes Masson's tumor, giant cell tumor of the synovial sheath, remnants of a hematoma, angiodysplastic vascular tumor, osteochondroma in a ganglion, soft tissue lesion with chondral matrix, and Nora's lesion (osteochondromatous proliferation periostally).
Excision was performed on April 28th, 2023. The 1.2 cm mass, macroscopically a hemangioma, showed proliferation of enlarged endothelial cells lining a fibrous connective stroma with foci of old (hemosiderin) and recent hemorrhage, and extensive fibrinohematic tissue, consistent with a Masson's tumor.
There was a recurrence at 4 months. A second surgery was performed on October 11th, 2023. The size of the recurrence was 2.2 cm. The pathological study reported ar ecurrence of the Masson's tumor with no signs of malignancy. The patient is currently asymptomatic.
Recurrence of Masson's tumor should be considered when establishing a differential diagnosis for malignant vascular lesions, which can lead to unnecessary aggressive treatments. Radiology provides guidance but is insufficient for diagnosis, as it may be confused with a hemangioma, low-grade angiosarcoma, or Kaposi's sarcoma. Histopathology is the definitive diagnostic method.
The authors declare no conflicts of interest.

A-0053 ACCURACY OF IMPLANT PLACEMENT USING AUGMENTED REALITY-ASSISTED TECHNIQUE IN TOTAL WRIST ARTHROPLASTY

Shimpei Watanabe[1], Takuji Iwamoto[1], Atsushi Tanji[2], Yasuhiro Kiyota[1], Taku Suzuki[1], Takeo Nagura[1], Masaya Nakamura[1]
[1]Department of Orthopaedic Surgery, Keio University School of Medicine, Tokyo, Japan; [2]Department of Orthopedic Surgery, Japanese Red Cross Ashikaga Hospital, Ashikaga, Japan

Introduction: Accurate implant placement is crucial for preventing complications and ensuring favorable long-term outcomes in implant arthroplasty. Techniques such as 3D preoperative planning, patient-specific instruments, and intraoperative navigation have significantly improved accuracy in hip and knee arthroplasty. However, there has been limited development of these intraoperative assistive technologies in total wrist arthroplasty (TWA). This study aimed to evaluate the accuracy of an augmented reality (AR)-assisted technique for implant placement in TWA, with the hypothesis that AR could help less experienced surgeons achieve accurate implant placement.
Methods: This study involved seven fresh frozen human cadavers (three male and four female) with an average age of 91 years (range, 82-96 years). A total of 14 upper extremities were disarticulated at the elbow joint and subjected to preoperative CT imaging. The preoperative CT images were imported into three-dimensional (3D) image analysis software (ZedEdit; LEXI Co., Ltd), and 3D preoperative planning was performed for each component to align with the axis of the third metacarpal and radius. All implants used were the DARTS Total Wrist System (Teijin Nakashima Medical Co., Ltd). The surgeries were performed by a single orthopedic resident with no clinical experience in TWA. On the right side, the resident performed the surgery independently using AR, while on the left side, the resident performed the surgery without AR under the guidance of one board-certified hand surgeon with experience in over 20 TWA procedures.

Postoperative CT scans were performed to assess translation and rotation errors in postoperative component placement relative to the preoperative plan.
Results: For the radial component, AR TWA resulted in significantly reduced errors in radio-ulnar translation, proximal-distal translation, internal-external rotation, and radio-ulnar rotation compared to non-AR TWA ($P<0.05$). For the carpal component, AR TWA showed significantly reduced errors in proximal-distal translation compared to non-AR TWA. However, non-AR TWA showed significantly fewer errors in radio-ulnar translation than AR TWA ($P<0.05$). No significant differences were observed in rotational errors of the carpal component between AR and non-AR TWA
Conclusion: AR-assisted technique demonstrated high accuracy, particularly in radial component placement, suggesting that even less experienced surgeons can achieve results comparable to those under specialist guidance. Given the limited number of cases and the challenges in gaining clinical experience, AR technology in TWA could potentially reduce the risk of complications associated with improper implant placement. However, a limitation of this study is the use of cadavers with normal joint surfaces; results may differ in joints with advanced destruction. Further research is necessary to determine the clinical applicability of AR-assisted TWA and its impact on long-term outcomes.

A-0054 OUTCOME OF MINIMALLY INVASIVE VOLAR PLATING FOR UNSTABLE DISTAL RADIAL FRACTURES IN ADOLESCENTS: A STUDY OF 16 CASES

Chul Ki Goorens[1], Antoine Van Ravesteyn[1,2], Sofie Peerlinck[1], Kjell Van Royen[2,3]
[1]Internation wrist center (IWC) Tienen, Regionaal ziekenhuis Tienen, Tienen, Belgium; [2]Universitair Ziekenhuis Brussel, Vrije Universiteit Brussel, Brussel, Belgium; [3]OLV ziekenhuis Aalst, Aalst, Belgium

Introduction: Volar plating has become the golden standard for most types of distal radial fractures in adults. In pediatric fractures, displaced fractures can be treated with closed reduction and casting if stable reduction is obtained; or with fixation by pinning or plating in case of unstable despite reduction or secondary displaced fractures. Adolescents have less bone remodelling capacity than younger children, so less residual deformity can be accepted during consolidation process. Volar plating is acknowledged to have increased fixation stability compared to pinning, but is obviously more invasive. Volar plating can be applied with minimal incision and pronator sparing, to decrease the invasiveness (MIPO). We evaluated the outcomes of minimally invasive volar plating for the treatment of distal radial fractures in adolescents.
Methods: This study included a cohort of adolescents with distal radial fractures treated with a standard Medartis plate with MIPO pronator-sparing technique. After 2 weeks of immobilization by analgesic splinting, gradual automobilization was allowed. Routine plate removal was performed after fracture consolidation. Postoperative evaluations were conducted to measure angular correction, functional range of motion, pain levels, and overall patient satisfaction
Results: The fracture types included 4 Colles fractures (AO A2) and 11 Smith (AO A3) fractures. 4 patients were treated with MIPO volar plate after secondary displacement with closed reduction. The mean age of participants was 12 years (10-14), with an average of 3 days (0-17) between initial trauma and surgical intervention. Preoperative assessment revealed a mean sagittal fracture angulation of 29 degrees (25-30). Postoperatively, fractures were corrected to angulation of 0° and a mean dorsal tilt of 12 degrees (7-14). After 6 months, mean total flexion-extension arc was 171 degrees (160-180), closely resembling the contralateral side's mean arc of 173 degrees. The pain levels reported using the Visual Analog Scale (VAS) averaged at 0,3 out of 10 (0-1). Patient satisfaction was notably high, with a mean score of 9,5 out of 10 (9-10). The average time to return to daily activities was 45 days post-surgery (42-60), and standard plate removal was performed after 5 months on average (4-6). During this secondary procedure, plate was removed by the same incision and with pronator still intact and spared, leaving the wrist pratically undamaged.

According to our results, minimally invasive volar plating is an effective and reliable method for managing distal radial fractures in adolescents. These findings support the adoption of minimally invasive techniques in pediatric orthopedic trauma, optimizing clinical outcomes while enhancing the overall patient experience. Further studies are recommended to validate these findings across larger populations and diverse clinical settings.

A-0055 PERIPHERAL NERVE REGENERATION USING A BIORESORBABLE SILK FIBROIN-BASED ARTIFICIAL NERVE CONDUIT FABRICATED VIA A NOVEL FREEZE-THAW PROCESS

Tomoki Matsuo[1,2], Takuji Iwamoto[1], Hiroo Kimura[1], Yasuhiro Kiyota[1], Taku Suzuki[1], Narihito Nagoshi[1], Makoto Sasaki[3,4], Yasushi Tamada[5], Masaya Nakamura[1]

[1]Department of Orthopaedic Surgery, Keio University School of Medicine, Tokyo, Japan; [2]Department of Orthopaedic Surgery, Ogikubo Hospital, Tokyo, Japan; [3]Faculty of Advanced Science and Technology, Kumamoto University, Kumamoto, Japan; [4]Charlie Lab Inc., Kumamoto, Japan; [5]Faculty of Textile Science and Technology, Shinshu University, Nagano, Japan

Introduction: We focused on silk fibroin (SF), a protein derived from natural silk, as a material that meets the requirements for an optimal artificial nerve conduit. While SF has high biocompatibility as a biomaterial, its effectiveness as an artificial nerve is not well known. In this study, we fabricated bioresorbable SF-based artificial nerve conduits (SFCs) via a novel freeze-thaw process and evaluated their efficacy in peripheral nerve regeneration in a rat sciatic nerve defect model.
Methods: We obtained SF from silkworm cocoons and prepared an 8 wt% SF aqueous solution containing 1 vol% DMSO. The solution was frozen at -20°C and thawed to form a hollow SFC. To evaluate its physical properties, the water content was calculated, and the pore size was measured using an electron microscope. The structural stability was also assessed by measuring the stress at 25% and 50% compression and the recovery rate after 50% compression. The degradability was evaluated using protease XIV. Next, the peripheral nerve regenerative effects of the SFC group were assessed using a 13 mm sciatic nerve defect model of the wild-type rats, comparing the autologous nerve group and the silicone tube group (n=10 for each). The following parameters were evaluated at 12 weeks after transplantation: sciatic functional index (SFI), range of motion of the ankle joint, von Frey monofilament test and Hargreaves test, compound muscle action potential (CMAP) amplitude of the gastrocnemius muscle, and weight of the gastrocnemius muscle. We also quantified regenerated axons (toluidine blue staining), myelination (MBP staining, G-ratio), angiogenesis (CD31 staining), and M2 macrophage recruitment (Iba-1 + Arginase1 staining) using immunostaining or electron microscopy.
Results: A SFC presented a water content of over 90% and an average pore size of 32 μm. The 25% and 50% compressive stresses were 0.07 ± 0.02 N and 0.16 ± 0.04 N, respectively, and the recovery rate after 50% compression was 98.5 ± 1.0%, suggesting favorable structural stability. Its degradability was also confirmed in an enzymatic degradation test over 28 days. In the in vivo study, the SFC maintained its lumen structure, in which favorable regenerative tissue was observed. The SFC group showed significant improvement in all evaluation items compared to the silicone tube group. In comparison with the autologous nerve group, the SFC group showed almost the same level of improvement in functional assessment, regenerated axon and myelination, although the recovery of the gastrocnemius muscle and CMAP amplitude was inferior. In addition, the SFC group presented significantly large positive areas for CD31 and Iba-1+Arginase1 staining, suggesting favorable angiogenesis and M2 macrophage recruitment.
Conclusion: The SFC exhibited high water content, porosity, structural stability, and degradability, and demonstrated positive peripheral nerve regenerative effects in a rat model. Our findings suggest that the unique physical properties of the SFC might further enhance the peripheral nerve regeneration mechanism, including vascularization, M2 macrophage recruitment, subsequent axonal elongation, and myelination. As no SF-based artificial nerve has been applied in clinical practice, the SFC constitutes a promising candidate for extensive peripheral nerve defects.

A-0056 HEEL RECONSTRUCTION USING A COMBINATION OF FREE SENSATE MEDIAL PLANTAR FLAP AND SKIN GRAFT: A CASE SERIES

Omid Liaghat
Zohre Shabbooie
[1]Shafa Yaheeyan Orthopedic Center, Iran University of Medical Sciences, Tehran, Iran; [2]Medical Journalism Department, Shiraz University of Medical Sciences, Shiraz, Iran

Introduction: Managing soft tissue defects in the heel presents a significant challenge for surgeons due to the heel's crucial role in bearing weight. We hope that the free instep flap, combined with end-to-side nerve anastomosis, offers surgeons a valuable option for reconstructing large heel defects.
Case presentation: Four patients referred to our hospital with a soft-tissue lesion in the weight-bearing heel and instep area. Their heels were reconstructed with a free instep flap from the other foot. In 3 cases, an end-to-side anastomosis of the artery was performed, while in the fourth case (due to a midfoot amputation), an end-to-end anastomosis of the artery was done more distally to preserve more collateral branches. The vein was anastomosed end-to-end to the posterior tibial vein in all cases. The epineurium of the medial plantar nerve was opened, and end-to-side nerve repair was done.
Conclusion: All of our patients demonstrated reasonable sensation, and none experienced flap shearing or ulceration. Flap thickness and shape were ideal, closely resembling the contralateral normal side.
Key words: free instep flap, medial plantar flap, heel reconstruction, anastomosis

A-0057 EVALUATION OF ARTICULAR SURFACE STRESS AND WEAR IN THUMB CARPOMETACARPAL OSTEOARTHRITIS

Kaoru Tada[1], Akihiro Kurosawa[2], Mika Akahane[1], Akari Mori[1], Kensho Suzuki[1], Masahiro Higuchi[2], Hiroshi Tachiya[2], Satoru Demura[1]
[1]Department of Orthopedic Surgery, Graduate School of Medical Sciences, Kanazawa University, Japan; [2]Institute of Science and Engineering, Faculty of Mechanical Engineering, Kanazawa University, Japan

Object: Thumb carpometacarpal (CMC) osteoarthritis is a condition with a high prevalence, but the mechanisms of its onset and progression remain largely unclear. This study aims to elucidate part of these mechanisms by evaluating the stress occurring in the thumb CMC joint using finite element analysis and assessing the wear of cortical bone in cases of thumb CMC osteoarthritis.
Materials and Methods: CT scans were obtained from five cases from each group of healthy individuals, early-stage, and late-stage CMC osteoarthritis. In Study 1, three-dimensional models of the CMC joint, comprising cortical bone, cancellous bone, and cartilage, were constructed from the CT data. A 50N load was applied in the direction of the inertial principal axis from the metacarpal head, and the stresses occurring at the articular surfaces of the metacarpal and trapezium were analyzed using finite element analysis software. In Study 2, three-dimensional models of the first metacarpal and trapezium composed of cortical bone were constructed, and the amount of cortical bone wear was evaluated by superimposing each model onto a reference model. The study was approved by the institutional ethics committee (2017-175).
Results: In Study 1, in healthy individuals, stress tended to occur on the volar side of the metacarpal articular surface and throughout the articular surface of the trapezium. In early- to late-stage CMC osteoarthritis, stress was observed on the volar side of the metacarpal articular surface in all cases. However, in early-stage osteoarthritis, stress was localized to the central region of the trapezium articular surface, while in late-stage osteoarthritis, stress was noted on the dorsal side of the trapezium.
In Study 2, significant cortical bone wear was observed on the volar-radial side of the metacarpal articular surface in

early-stage osteoarthritis compared to healthy individuals. In late-stage osteoarthritis, significant wear was observed on the volar side of the metacarpal articular surface and the ulnar side of the trapezium.
Discussion: The first metacarpal experienced volar stress and wear across all stages of osteoarthritis, while the location of stress in the trapezium shifted according to disease progression, with wear occurring across the entire articular surface. These results suggest that changes in articular congruency, particularly on the trapezium side, due to dorsal subluxation with disease progression, may have influenced the findings. The results of this study provide valuable insights for the prevention and treatment of thumb CMC osteoarthritis.
Summary: We evaluated the stress and wear on the joint using CT data from both healthy individuals and patients with thumb CMC osteoarthritis. The results showed that, regardless of the disease stage, stress was consistently applied to the volar side of the first metacarpal, leading to wear on the volar surface. In contrast, the location of stress and wear in the trapezium varied depending on disease progression.

A-0058 DOES SCAPHOID FRACTURE SURFACE MORPHOLOGY CORRELATE WITH FRACTURE STABILITY? (VIDEO)

Y Simcovich Frish[1], E Eigner[1], L Joskowicz[2], I Volk[1], A Arami[3], M Stern[3], S Luria[1]
[1]Hadassah-Hebrew University Medical Center, Jerusalem; [2]Hebrew University, Jerusalem; [3]Shiba Medical Center, Ramat Gan

There is general consensus that unstable acute scaphoid fractures should be treated surgically. There is less agreement regarding the criteria of the diagnosis of an unstable fracture. We aimed to examine the correlation between fracture surface morphology and stability of acute scaphoid fractures. Our hypothesis was that increased irregularity of the fracture would be more stable.
We screened the archives of two large medical centers for wrist CT scans with isolated acute scaphoid fractures in patients between the ages 18-65. The fractures were categorized according to fracture location (proximal, waist, distal) and displacement status (displaced, non-displaced, as a measure of instability). Using 3D computer analysis (TKinter is an open-source and standard GUI toolkit for Python), the scaphoid and scaphoid fracture were manually segmented. A model-based method was designed to evaluate the fracture area, volume and surface uniformity. It uses principal component analysis and a computed motion graph. The graph indicates the expected translation of the distal fragment fracture surface against the proximal fragment surface. Using this graph, we then measured the number of obstacles across the surface plain, the highest obstacle, its entry and exit angles, and its distance from the beginning of the graph. We then examined the correlation between these parameters and fracture displacement according to location.
A total of 75 fractures were analyzed. Displaced waist fractures demonstrated more irregularity in comparison to non-displaced fractures, with higher obstacles ($p=0.036$), more obstacles ($p=0.028$) and more obstacles correcting for surface area ($p=0.012$). Distal and proximal fracture demonstrated a different pattern of displacement.
These results suggest that fracture morphology, particularly of waist fractures, is correlated with fracture stability. In contrast to our hypothesis, greater irregularity was correlated with displacement and maybe an additional indication of fracture instability. It is possible that fracture irregularity as well as displacement are measures of mechanism or of higher energy trauma.

A-0059 FROM PAPER TO DIGITAL: REVOLUTIONIZING DOCUMENTATION AND DIGITAL DATA VISUALISATION OF HANDFUNCTION

Andrea Moser
Private Praxis Ergotherapie Moser, Sankt Veit an der Glan, 9300

At FESSH 2024 in Rotterdam, I proudly took home 2nd place in the Shark Tank competition with the concept of a digital app designed to transform the documentation process in hand therapy. This recognition not only affirmed the innovation and importance of the project but also provided the momentum to bring the app from concept to reality. With the prize money and support from a start-up program through the Build Founder Center in Carinthia, I successfully developed the app over the past year.
This app is set to be completed by spring 2025 and offers a groundbreaking solution for digitalizing documentation in hand therapy. Traditionally, therapists rely on paper-based assessments, which complicate data collection, comparison, and storage. The new app streamlines these processes, providing clear visual results using traffic light indicators to compare patient outcomes to normative values. It allows for digital, accessible, and well-organized documentation that effectively visualizes patient progress.
By returning to FESSH 2025, I aim to showcase how last year's Shark Tank award was instrumental in realizing this project. The app is now a valuable tool for both surgeons and hand therapists, enhancing the documentation process, improving efficiency, and supporting better patient outcomes.
The shift from paper to digital documentation is essential for modernizing our profession. It not only improves the clarity and visual appeal of treatment results but also fosters transparency and efficiency in occupational therapy. This app will significantly benefit both clinicians and patients, making documentation more streamlined and insightful, and ensuring that progress is easily tracked and communicated.

A-0060 OUTCOMES OF DISTAL RADIUS FRACTURES IN HIGH-ENERGY TRAUMA PATIENTS: OPERATIVE V.S. CONSERVATIVE

Masahiro Miyashita, Kenichiro Uchida, Tetsuro Nishimura, Yasumitsu Mizobata
Osaka Metropolitan University Graduate School of Medicine, Japan

Introduction: High-energy trauma often results in distal radius fractures, and surgical indications are determined based on the patient's general condition and background. In case with brain injury or other severe injuries, the fractures tend to be treated conservatively, and these treatments may cause the risk of complications such as malunion and contracture.
Objectives: The purpose of this study is to clarify the outcomes of patients with distal radius fractures treated at our trauma center by surgical or conservative treatment.
Methods: We retrospectively investigated the final correction angle of ulnar variance (UV) and volar tilt (VT) after reduction, and complications at the final observation for 25 hands of 24 patients with distal radius fractures caused by high-energy trauma transported to our center from April 2019 to March 2024. We compared the surgical group (O) and plaster cast immobilization group (C), excluding deaths and fractures without displacement. The average age of the patients was 46 years (19-90), and there are 11 males, 13 females, 15 right side injuries and 10 left side injuries. In the AO classification, 3 cases were A1, 2 cases were A2, 7 cases were A3, 6 cases were C1, 1 case was C2, and 6 cases were C3. The average ISS was 17.4, the average follow-up period was 5.5 months, and 18 cases were treated surgically. Seven cases were treated conservatively, corrected and immobilized with a plaster cast.

Results: As a complication, ulnar shortening osteotomy was performed in one case due to malunion caused by conservative treatment. There were no tendon ruptures, pseudoarthrosis, or infections, and implant removal was performed in 6 cases. The VT correction angle was significantly better in the O group than in the C group (p=0.029), but there was no significant difference in the UV correction angle between the two groups.
Discussion: It is assumed that fractures caused by severe external force also cause severe damage to the surrounding soft tissue. Although plaster cast fixation was inferior to surgical treatment about deformity correction, the incidence of complications was low and there were no skin problems. At our center, the decision of surgical indication was made by an emergency orthopedic surgeon who specializes in hand surgery, which is thought to be the reason for the good results. Appropriate intervention is essential to avoid preventable functional disabilities.
Conclusion: Conservative treatment of distal radius fractures due to high-energy trauma resulted in a poorer VT correction angle than surgical treatment, but there were few complications and the outcome was acceptable.

A-0061 EVALUATION OF PERCUTANEOUS VOLAR FIXATION IN HERBERT B1/B2 TYPE SCAPHOID FRACTURES: INVESTIGATING OUTCOME DISCREPANCIES BASED ON FRACTURE MORPHOLOGY

Soo-Hong Han, Segi Kim, Chi-Hoon Oh, Cheungsoo Ha
Department of Orthopedic Surgery, CHA Bundang Medical Center, Seongnam, South Korea

Purpose: Scaphoid fractures, despite their frequency, are often under-addressed, leading to enduring complications. Given the precarious vascular anatomy, delayed or inadequate treatment often results in nonunion, significantly impacting daily functionality. As such, treatments for scaphoid fracture have been called for attention. Since Herbert introduced the classification system in 1984, numerous studies have widely adopted it. However, to date, there remains no consensus on treatment guidelines for each subtype, especially B1 and B2, which together account for the majority of scaphoid fractures. In the case of B1 type, fractures can occur relatively close to the proximal pole and due to their oblique nature, inserting a screw perpendicular to the fracture line using percutaneous fixation can be more challenging than B2. Nevertheless, percutaneous volar fixation method has widely been used for types B1 and B2. This study aims to explore the clinical outcomes of percutaneous volar fixation in Herbert classification B1/B2 acute and subacute scaphoid fractures, while also attempting to analyze potential factors influencing the results.
Methods: This retrospective study involved 60 patients who underwent percutaneous fixation for Herbert B1/B2 acute & subacute scaphoid fractures. The cohort comprised 27 B1 and 33 B2 cases, with mean ages of 38.2 ± 14.2 years for B1 and 31.1 ± 13.7 years for B2. The mean time follow-up periods of 20.8 ± 25.3 months for B1 and 17.4 ± 6.9 months for B2. Radiographic analysis assessed bony union, screw trajectory, supplemented by Range of Motion (ROM) and Disability of the Arm, Shoulder, and Hand (DASH) evaluations for functional outcomes
Results: Bony union was achieved in 60 out of 60 patients (100%). In terms of screw trajectory, the mean screw length was 22.9 ± 2.2 for B1 and 21.7 ± 1.7 for B2; the mean screw angle was 65.6 ± 7.3 for B1 and 81.8 ± 4.9 for B2. At the last outpatient follow-up, ROM measurements were recorded as follows: 78.0 ± 15.3, 73.7 ± 18.5, 20.6 ± 8.7, 26.1 ± 7.5 for B1 and 77.1 ± 9.8, 75.5 ± 12.8, 21.2 ± 8.4, 25.5 ± 8.1 for B2, Dorsi-Flexion (DF), Volar-Flexion (VF), Radial-Deviation (RD), and Ulnar-Deviation (UD) respectively. The mean DASH score was 31.2 ± 10.6 for B1 and 30.6 ± 11.4 for B2. No significant differences were observed between B1 and B2 fracture groups concerning ROM and DASH scores.
Conclusion: Percutaneous volar fixation demonstrates reliable results in both Herbert B1/B2 acute & subacute scaphoid fracture groups, establishing itself as a viable and effective treatment option.

A-0062 PREVENTIVE EFFECTS OF KAMPO MEDICINE ON SKIN FLAP NECROSIS: AN EXPERIMENTAL STUDY USING A RAT MODEL

Akari Mori[1], Mika Akahane[1], Soichiro Honda[1], Kensho Suzuki[1], Taisuke Furuta[2], Keiko Ogawa[3], Kaoru Tada[1], Satoru Demura[1]
[1]Department of Orthopaedic Surgery, Graduate School of Medical Sciences, Kanazawa University, Japan; [2]Department of Orthopaedic Surgery, Hiroshima University, Japan; [3]Kampo Clinical Center, Department of General Medicine, Hiroshima University Hospital, Hiroshima, Japan

Background: Compromised blood flow leading to necrosis remains a significant challenge in skin flap surgery, with reported necrosis rates ranging from 10% to 30% in various clinical studies. While conventional treatments including vasodilators and anticoagulants have shown limited success, there is growing interest in alternative therapeutic approaches. Traditional Japanese (Kampo) medicines have been used for centuries to improve circulation and post-operative recovery, with documented effects on microcirculation and wound healing. However, their specific effects on skin flap survival have not been well documented in previous studies.

Purpose: To investigate the preventive effects of two Kampo medicines - Ninjinyoeito (NYT) and Tokishakuyakusan (TSS) - on skin flap necrosis using a rat model: NYT is traditionally used for improving general constitution and peripheral circulation, while TSS is specifically indicated for blood stasis and microcirculatory disorders.

Methods: Eight-week-old Wistar rats were randomly divided into three groups after creating a 1×6 cm unilateral dorsal pedicled skin flap. The control group received standard feed, while the NYT and TSS groups received feed mixed with respective Kampo medicines (1% concentration) for seven days post-surgery. The skin flap model was designed to create consistent partial necrosis, with the distal portion of the flap experiencing compromised blood flow. Digital photographs were taken on days 3, 5, and 7 post-surgery. Necrotic areas were measured using image analysis software, and necrosis rates were calculated as the ratio of necrotic area to total flap area. Statistical analysis was performed using Kruskal-Wallis and Dunn's tests with a significance level of 5%.

Results: Mean necrosis rates in the control group were 13.1%, 22.4%, and 24.9% on days 3, 5, and 7, respectively. The NYT group showed rates of 13.7%, 21.1%, and 21.4%. The TSS group demonstrated significantly lower rates at 4.2%, 12.3%, and 15.8%. TSS group rates were significantly lower than both control and NYT groups on day 3 ($p=0.002$, $p=0.004$) and remained significantly lower than the control group on days 5 and 7 ($p=0.047$, $p=0.029$).

Discussion: While various treatments have been attempted, no definitive method exists for completely preventing skin flap necrosis. Our study provides the first experimental evidence that TSS can significantly reduce skin flap necrosis rates. TSS contains multiple active compounds that may work synergistically: Angelica root improves microcirculation, Peony root has anti-inflammatory effects, and Cnidium rhizome enhances nitric oxide production. These mechanisms likely contribute to improved flap survival through enhanced microcirculation and reduced inflammatory response. The superior performance of TSS over NYT suggests that targeted improvement of local blood flow may be more effective than general constitutional enhancement in preventing flap necrosis.

Conclusion: This study demonstrates the potential effectiveness of Kampo medicine, particularly TSS, in preventing skin flap necrosis. The significant reduction in necrosis rates suggests a promising new approach for clinical application in reconstructive surgery. Future clinical trials are warranted to validate these findings in human subjects and establish optimal treatment protocols.

Keywords: Skin flap, Necrosis, Kampo, Rat model, Soft tissue reconstruction

A-0063 EFFECTIVENESS OF EXERCISE SPLINTS IN HAND REHABILITATION: INNOVATIVE APPROACHES TO IMPROVE THE DIGITAL RANGE OF MOTION AND ENHANCE PATIENT EMPOWERMENT

Andrea Moser, OT, HT
Andrea Moser - private praxis and UKH Klagenfurt, Klagenfurt, Austria

Introduction: Restoring finger mobility after injury is challenging, especially when patients practice independently at home. Many fail to reach their rehabilitation goals due to uncertainties around their exercises— how far to move, how often to repeat a movement or how often to practice. Patients also struggle to recognize movement endpoints (End of Range) and how to maintain end positions for optimal range of motion (Total End Range Time). This lack of clarity and body awareness can hinder recovery.
Exercise splints offer a promising solution by providing clear visual and tactile feedback on movement directions and endpoints. They help patients understand joint positions, promote repetition, and integrate both active and passive movements, enabling healthy fingers to support injured ones. Splints also facilitate independent training without needing extra help and they are flexible, quickly adapting to a patient's progress.
Methods: In this presentation, I will introduce an innovative concept of the exercise splints, a method I developed to enhance recovery outcomes. These splints are designed to bridge the gap between clinical therapy and home exercise, empowering patients to train independently and confidently.
Results: The idea has sparked global interest and positive feedback, particularly through Instagram, where my account (@handtherapy_austria) has reached over 6,000 followers and up to 100,000 views on posts related to this concept.
In addition, I will be presenting alongside an occupational therapist from Italy, Mrs Rose Luciano, whom I connected with through social media. She has successfully tested these splints in her practice and will share several case studies, demonstrating their practical application and the improvements seen in her patients' finger mobility.
Conclusion: These exercise splints offer a breakthrough in rehabilitation by giving patients a clear movement goal and improving finger and hand mobility. This presentation will show how social media-driven collaboration and innovation can lead to practical solutions in hand therapy.

A-0064 PRACTICAL WORKSHOP: EFFECTIVENESS OF EXERCISE SPLINTS IN HAND REHABILITATION: AN INNOVATIVE APPROACH TO IMPROVE DIGITAL RANGE OF MOTION AND PATIENT EMPOWERMENT

Andrea Moser
Andrea Moser - private praxis and UKH Klagenfurt, Klagenfurt, Austria

Introduction: Restoring finger mobility after injury is challenging, particularly when patients practice independently at home. Uncertainty around how to perform exercises—how long to hold a joint, how far to move, or how often to practice—often prevents patients from reaching their rehabilitation goals. Additionally, patients struggle to recognize movement endpoints (End of Range) and maintain optimal end positions for the best range of motion (Total End Range Time). This lack of clarity and body awareness can hinder the recovery process.
Exercise splints offer an effective solution by providing clear visual and tactile feedback on movement directions and endpoints. They help patients better understand joint positions, promote repetition, and integrate both active and passive movements. These splints allow healthy fingers to assist injured ones and facilitate independent training without the need for external help, while also being flexible enough to adapt to a patient's progress.
Methods: In this workshop, I will introduce three important splint models, guiding participants step by step through the

process of making these splints. The focus will be on teaching practical skills in splint fabrication, with special emphasis on my new innovation: splints that provide patients with a clear movement goal to enhance rehabilitation outcomes
Results: This idea has gained attention and positive feedback globally, especially through my work on Instagram (@ handtherapy_austria), where I've engaged over 6,000 followers and reached up to 100,000 views on posts about these splints.
Additionally, I have connected with an occupational therapist from Italy through social media, and she has already tested my splint concepts in her practice. She will share several case studies, demonstrating how these models have been successfully applied with patients.
Conclusion: This hands-on workshop will empower therapists to use exercise splints effectively in clinical and home settings. By offering a clear movement goal, these splints bridge the gap between therapy sessions and independent home exercise, improving finger and hand mobility.

A-0065 TWO FLEXOR TENDON CASE STUDIES DEMONSTRATING A NEW AND NOVEL METHOD FOR GAINING FLEXOR TENDON EXCURSION USING EXERCISE SPLINTS

Rose Luciano
Fisiomano, Clinica Villa Sant'Apollonia, Bergamo, Italy

Introduction: Gaining flexor tendon excursion following repair is easier now than in the past due to the advent of stronger multi-strand sutures, intraoperative testing of the repair, and early active motion protocols (1); nonetheless, some patients still develop adhesions that limit tendon gliding.
Moreover, after implementing all the rehabilitation flexor tendon treatment techniques, available to the therapist, which include partial active motion in the first 3 weeks post-surgery, passive motion, edema control, and subsequently full active motion at 4 to 6 weeks following repair, full tendon excursion can still be difficult to achieve.
With the goal of improving flexor tendon motion, despite using all the traditional techniques cited in the literature, I found myself searching social media websites for some new ideas that could assist in gaining digital active range of motion. I discovered an Instagram account by Andrea Moser @handtherapy_austria that was full of novel and innovative ideas, such as, using exercise splints for gaining digital flexion.
Method: Two exercise splints were chosen to improve active range of motion in two patients. One patient sustained a flexor tendon repair of the flexor digitorum profondus (FDP) (zone 2) and the other patient underwent repair of the flexor pollicis longus (FPL) tendon (zone T2). An early active motion protocol was utilized in both case studies immediately following surgery.
Results: Using the flexor tendon excursion evaluation of Strickland and Glogovac (2) the patient with FDP repair in zone 2 of the 4th digit, at 10 weeks post-surgery, obtained an excellent score of 82% or 145º of active flexion (110º at the PIP joint and 35º at the DIP joint) but was not satisfied with 35 degrees of DIP joint flexion. Two weeks after fitting him with an exercise splint he gained 100% active flexion at the DIP joint.
The patient with the FPL repair, at 6 weeks post-surgery, had gained 35º degrees of active interphalangeal (IP) joint flexion whereas the non-involved thumb IP joint presented with 80º of active flexion. At 3 months post-surgery, thumb IP joint flexion motion was not improving and therefore we decided to use an exercise splint. After 3 weeks, the patient gained another 30º of flexion resulting in a total 81% of flexion when compared to the non-involved side.
Conclusion: The excellent range of motion obtained in these two flexor tendon case studies demonstrates the effectiveness of exercise splints as an adjunct treatment in flexor tendon rehabilitation.

Bibliography:
1) Tang JB, Lalonde D, Harhaus L, Sadek AF, Moriya K, Pan ZJ. Flexor tendon repair: recent changes and currents methods. J Hand Surg Eur Vol. 2022: Jan;47(1):31-39.
2) Strickland JW, Glogovac SV. Digital function following flexor tendon repair in Zone II: a comparison of immobilization and controlled passive motion techniques. J Hand Surg Am. 1980;5(06):537-543.

A-0066 LIMB SALVAGE IN SEVERE BALLISTIC HAND INJURY: A STAGED RECONSTRUCTION APPROACH

Shai Factor, Oren Rudik, Franck Atlan, Gilad Eisenberg, Daniel Tordjman, Yishai Rosenblatt, Tamir Pritsch
Tel Aviv Medical Center, Tel Aviv, Israel

This presentation highlights a challenging case of a 34-year-old male who experienced severe right-hand trauma due to a gunshot injury during the Israel-Hamas war. The patient presented with open fractures of the 1st, 2nd, and 3rd metacarpals, accompanied by substantial bone loss and infection. The treatment involved a series of staged procedures, including debridement, antibiotic spacer placement, distraction for temporary length, and external fixation. Subsequently, a reverse radial forearm flap was utilized for soft tissue coverage, followed by fracture stabilization using autologous bone graft and internal fixation.
The objective of this case presentation is to underscore the intricacies associated with high-energy ballistic injuries and emphasize the importance of employing a stepwise approach for limb salvage. The utilization of antibiotic spacers, distraction osteogenesis, soft tissue coverage, bone grafting, and definitive fixation collectively demonstrates the comprehensive management required for such complex cases.

A-0067 NON-OPERATIVE MANAGEMENT OF TERRIBLE TRIAD INJURIES: A RETROSPECTIVE ANALYSIS OF 39 CASES

Shai Factor, Gilad Eisenberg, Ron Gurel, Oren Rudik, Franck Atlan, Daniel Tordjman, Yishai Rosenblatt, Tamir Pritsch
Tel Aviv Medical Center, Tel Aviv, Israel

Elbow dislocations associated with fractures of the radial head (RH) and coronoid process, often termed the "terrible triad," present significant challenges in achieving joint stability and optimal functional recovery. Traditionally, surgical intervention has been favoured to address these injuries, including techniques such as radial head fixation or replacement, lateral collateral ligament (LCL) repair, and coronoid fracture stabilization, all aimed at restoring joint integrity and allowing early mobilization. However, surgical management carries risks, including restricted range of motion, stiffness, heterotopic ossification, nerve injury, and reoperation rates. Recently, nonoperative management of terrible triad injuries (TTI) has garnered interest, particularly for select patients, as emerging studies suggest that conservative management may yield positive outcomes in carefully selected cases.
This retrospective study aims to further the understanding of nonoperative management for TTI by analysing outcomes in patients who initially presented as candidates for surgery based on imaging but ultimately underwent conservative treatment.
From 2014 to 2022, a total of 39 patients (23 males, 16 females; mean age 45.9 $\pm$ 18.8 years, range 18-92) with TTI were treated conservatively. The most frequent mechanism of injury was falls (46%), followed by bicycle or scooter accidents (38%), and motor vehicle accidents (15%). The majority of injuries affected the non-dominant arm (59%). Radial head fractures were most commonly classified as Mason type 2 (54%), with coronoid fractures predominantly classified as

Regan-Morrey type 1 (69%).
The average follow-up was 71 ± 29 months (range 29-124).
MEPS outcomes were largely positive, with 71.8% achieving excellent scores (>90), 20.5% rated as good (75-89), and 7.7% as fair (60-74); no patients scored poorly (<60). The average DASH score was 18.2 (range 2-68). Range of motion (ROM) was assessed for all patients. The majority regained functional flexion and extension, with an average flexion of 120 degrees and an extension mean deficit of 10 degrees. In terms of forearm motion, patients achieved an average of 80 degrees of pronation and 85 degrees of supination.
The overall complication rate was low (12.8%), with mechanical symptoms noted in 5.1% of cases. Most patients (97.4%) returned to work within an average of 2.8 months, with only one patient unable to resume prior employment. Notably, the predominance of office workers (74.4%) in the sample may have influenced the high return-to-work rates observed. During follow-up, five patients, representing 12.8% of the cohort, required delayed surgical interventions, including radial head resection, heterotopic ossification resection, or radial head replacement.
This study contributes to the limited but growing evidence supporting nonoperative management for TTI in selected cases. Functional outcomes appear comparable to those reported for surgical cases, suggesting that conservative treatment may be a viable alternative, particularly for patients presenting with less severe injury patterns or those facing increased risks from surgery. Additionally, the higher proportion of scooter-related injuries highlights a shift in injury patterns, underscoring the need for contemporary treatment protocols.

A-0069 ASSOCIATION OF EARLY POSTOPERATIVE SLEEP DISTURBANCES WITH FUNCTIONAL OUTCOMES FOLLOWING DISTAL RADIUS FRACTURE FIXATION

Kazuya Odake, Akimasa Morita
Suzuka Kaisei Hospital, Suzuka City, Japan

Introduction: Sleep disturbances have been reported to lower pain thresholds and are associated with upper limb dysfunction, although it is rarely quantified or objectively used as a parameter for postoperative outcome. Additionally, there is a discrepancy in the importance of sleep status between healthcare providers and patients. This study aimed to investigate the relationship between sleep disturbances and postoperative outcomes in patients with distal radius fractures (DRF).
Materials and Methods: Thirty patients (9 men and 21 women; mean age 64.4 years) who underwent surgery for DRF using volar locking plates between January 2019 and December 2022 were included in the study. Sleep status was evaluated three months postoperatively using the Athens Insomnia Scale (AIS). Patients were divided into two groups based on the presence of suspected sleep disturbances (AIS ≥ 4) or no sleep disturbances (AIS ≤ 3). The two groups were compared in terms of sex, age, height, weight, comorbidities (diabetes, hypertension, dyslipidemia), fracture type, implant type, postoperative pain, and the Hand20 scores (Hand20) at both three months and the final follow-up (mean follow-up period 11.4 months).
Results: Of the 30 cases, 19 had no sleep disturbances (AIS ≤ 3), while 11 had suspected sleep disturbances (AIS ≥ 4). There were no significant differences between the groups regarding sex, age, height, weight, comorbidities, fracture type, or implant type. At three months postoperatively, no significant differences were found in pain or Hand20 between the groups. However, at the final follow-up, the group with suspected sleep disturbances had significantly higher pain scores ($p < 0.05$) and tended to have higher Hand20 compared to that with no sleep disturbances
Conclusions: This study suggests that sleep disturbances in the early postoperative period (three months) may negatively

affect the outcomes approximately one year after surgery in patients undergoing DRF. Evaluating sleep disturbances postoperatively could serve as a useful parameter in postoperative assessments.

A-0070 TREATMENT COMPLICATIONS IN PEDIATRIC FOREARM FRACTURES IN FINLAND

Caroline Dikert[1], Yrjänä Nietosvaara[1,2], Petra Grahn[1]
[1]New Children's Hospital, Helsinki University Hospital, Helsinki, Finland; [2]Kuopio University Hospital, Kuopio, Finland

Hypotheses: The rate of treatment complications in management of pediatric forearm fractures is largely unknown. We hypothesized that the overall risk for iatrogenic complications is low and permanent sequalae of these complications occur mainly in children with forearm shaft or proximal forearm fractures.
Methods: This study used data from the Finnish Patient Insurance Centre (PIC), which reviews all claims regarding treatment and grants compensation based on excess pain or permanent cosmetic and/or functional disability if given treatment is considered of substandard quality. We analyzed all claims sent to PIC concerning pediatric forearm fracture management in children under 16-years of age in Finland between 1990 and 2020. The average annual census population during the 30-year study period was 985,029. The estimated incidence of a pediatric forearm fracture in Finland is 650 per 100 000, of which at least two thirds are distal forearm fractures.
Results: 144 of 226 claims were compensated. Compensation was awarded for 58 distal forearm fractures, 55 forearm shaft fractures, and 31 proximal forearm fractures, with an overall risk of 0.1%. Complications of treatment occurred in district hospitals (n=83, 53%), university hospitals (n=34, 22%), health care centers (n=31, 20%) and private clinics (n=10, 6%). Orthopedic surgeons (n= 43, 27%), general practitioners (n=33, 21%), surgical trainees (n=30,19%) and pediatric surgeons (n=29, 18%) were the largest groups of treating professionals at fault. Unsatisfactory standard of surgery was the reason for the compensation in 30/55 children with forearm shaft fractures, delayed diagnosis in 20/31 children with proximal forearm fractures respectively. Failure to detect the fracture in radiographs was the reason for the delayed diagnosis in all but one case. Compensation for permanent cosmetic disability was paid to 66 (46 %), and for permanent functional disability to 35 (24%) children. Permanent functional disability was compensated in 10 (32%) children with proximal, 20 (36%) with shaft and 5 (9%) with distal forearm fractures.
Summary points: The risk for sustaining a compensated treatment complication in management of a pediatric forearm fracture in Finland is low. Proximal forearm and forearm shaft fractures are associated with a clearly higher risk of iatrogenic complications with permanent sequalae than distal forearm fractures.

A-0071 DEPRESSED DEFORMITY OF THE COLLATERAL LIGAMENT ATTACHMENT AREA MAY APPEAR IN HAND OA

Kensho Suzuki[1], Mika Akahane[1], Soichiro Honda[1], Akari Mori[1], Hiroki Kawashima[2], Wataru Mitsui[2], Tadanori Takata[2], Katsuhiro Ichikawa[2], Kaoru Tada[1,2], Satoru Demura[1]
[1]Department of Orthopaedic Surgery, Graduate School of Medical Sciences, Kanazawa University, Japan; [2]School of Health Sciences, College of Medical, Pharmaceutical and Health Sciences, Kanazawa University, Japan

Hypothesis: We have been using High-Resolution CT for Extremities (HRCTe), with a resolution of approximately 0.1 mm, to evaluate finger bones. In cases of hand osteoarthritis (OA), we often observe a concave deformity at the attachment sites of the collateral ligaments on the distal metacarpal or distal phalangeal bones. The purpose of this study is to investigate the relationship between hand OA and these concave deformities.

Methods: The study included 5 healthy controls and 14 patients with hand OA who underwent HRCTe in our department. A total of 44 distal interphalangeal (DIP) joints and 32 proximal interphalangeal (PIP) joints from the index to the little fingers were examined. Radiographs were taken over a 50 mm range along the long axis, centered on either the DIP or PIP joint, and were reviewed by three orthopedic surgeons. The examiners assessed joint space narrowing and osteophyte formation on frontal radiographs using a four-point scale (0-3) based on the OARSI atlas. Additionally, HRCT images were reviewed to identify concave deformities at the attachment sites of the collateral ligaments on both the radial and ulnar sides. Internal consistency of the assessments—joint space narrowing, osteophyte grading, and presence of concave deformities—was evaluated using Cronbach's alpha.

Results: Cronbach's alpha was 0.93 for joint space narrowing, 0.94 for osteophyte formation, and 0.78 and 0.80 for concave deformities on the radial and ulnar sides, respectively. In cases with grade 0 joint space narrowing and osteophyte formation, concave deformities were observed in approximately 20% of cases. However, in grade 1 or higher cases, concave deformities were present in about 50% of cases. In healthy controls, concave deformities were observed in only 2% of cases.

Conclusion: Previous studies have reported thickening of the collateral ligaments and changes at their attachment sites in hand OA. This study found that concave deformities were frequently present in hand OA cases with grade 1 or higher joint space narrowing and osteophyte formation, suggesting a potential link between concave deformities, joint space narrowing, and osteophyte formation.

Summary: This study investigated the relationship between hand OA and concave deformities at the attachment sites of the collateral ligaments in the finger joints, using HRCTe. The study included 5 healthy individuals and 14 patients with hand OA, examining a total of 44 DIP and 32 PIP joints. Joint space narrowing, osteophyte formation, and the presence of concave deformities were evaluated. Results showed that concave deformities were observed in 50% of cases with grade 1 or higher OA but were rare in healthy controls. The findings suggest a potential link between concave deformities, joint space narrowing, and osteophyte formation in hand OA.

Key words: Hand, CT, Osteoarthritis, Collateral ligament, Concave deformity

A-0072 MODIFIED INTRAVASCULAR STENT FOR MICROVASCULAR SUTURE IN A RAT SUPERFICIAL FEMORAL ARTERY

Kosuke Maeda[1], Taku Suzuki[1], Yasuhiro Kiyota[1], Noboru Matsumura[1], Kazuki Sato[2], Takuji Iwamoto[1], Masaya Nakamura[1]
[1]Department of Orthopedic Surgery, Keio University School of Medicine, Tokyo, Japan; [2]Institute for Integrated Sports Medicine, Keio University School of Medicine, Tokyo, Japan

Background: The intravascular stent (IVaS) is sometimes used for suturing small vessels. In this technique, a nylon stent is temporarily placed in the vascular lumen during suturing, and the last one or two stitches are left untied to allow for the removal of the stent. This method improves visibility of the vessel lumen and helps prevent suturing of the posterior wall. The effectiveness of IVaS has been demonstrated in smaller-diameter vessels and lymphatics in supermicrosurgery. However, a challenge with IVaS is the difficulty in removing the stent after suturing.

To address this issue, we developed an IVaS that integrates a stent with a manipulating string. This study aimed to assess the usefulness of the modified IVaS (M-IVaS) by comparing it to conventional suturing without IVaS (CS) and conventional IVaS (C-IVaS).

Methods: Forty-five superficial femoral arteries from male, 7-week-old Wistar rats were used. The rats were randomly divided into three groups: CS, M-IVaS, and C-IVaS, with 15 rats per group. Patency rate, operating time, and ultrasonographic blood flow dynamics were examined immediately after suturing. Patency tests, ultrasonographic evaluations, and histological analyses were performed at 1 week ($n = 5$), 2 weeks ($n = 5$), and 6 weeks ($n = 5$) post-surgery. For

ultrasonographic evaluations, the probe was placed directly over the vessel at the suture site and 1.5 mm proximal to the suture site. Measurements included peak systolic velocity, long-axis diameter, short-axis diameter, and cross-sectional area of the vessel at both sites. Histological analyses, conducted in a blinded manner by a pathologist, assessed the regeneration of endothelial cells, tunica media, and any vascular wall damage. All sections underwent hematoxylin and eosin staining, Elastica van Gieson staining, and CD31 immunostaining.
Results: All three groups demonstrated vessel patency immediately after suturing, as well as at 1 week, 2 weeks, and 6 weeks post-surgery. The mean operative time was 22.6 minutes for the CS group, 21.5 minutes for the M-IVaS group, and 25.9 minutes for the C-IVaS group. A significant difference was observed between the M-IVaS and C-IVaS groups ($P = 0.01$). No significant differences in peak flow velocity or stenosis rate were observed among the three groups in ultrasonographic evaluations. Histopathological analyses showed no damage to the internal elastic lamina, and the recovery of endothelial cells and tunica media at the suture site was comparable to that observed with the CS method.
Conclusion: The surgical time with M-IVaS was significantly shorter than with C-IVaS, and M-IVaS minimized the difficulties associated with C-IVaS removal. The effectiveness of M-IVaS was comparable to that of CS in terms of patency rate, operating time, ultrasonographic blood flow dynamics, and histological outcomes. M-IVaS has potential utility in the field of microsurgery.

A-0073 COMPUTER ASSISTED SURGICAL PLANNING FOR A MYOKINETIC INTERFACE FOR HAND PROSTHESES

Giorgia Romita[1], Marta Gherardini[1], Flavia Paggetti[1], Edoardo Ipponi[2], Olimpia Mani[3], Lorenzo Andreani[2], Christian Cipriani[1]
[1]The Biorobotics Institute, Scuola Superiore Sant'Anna, and the Department of Excellence in Robotics and AI, Scuola Superiore Sant'Anna, Pisa, Italy; [2]Orthopaedics and Traumatology Unit, University Hospital of Pisa, Pisa, Italy; [3]Department of Reconstructive Surgery and Hand Surgery, Azienda Ospedaliera Universitaria delle Marche, Ancona, Italy

Upper-limb amputations severely compromise the ability to manipulate objects. This ability can be restored through advanced robotic prostheses, controlled by suitable human-machine interfaces (HMIs). A newly developed myokinetic HMI demonstrated the potential to overcome the limitations of traditional surface electromyographic (EMG) interfaces. By using magnets implanted in the muscles and external magnetic field sensors, this interface reconstructs muscle deformation during contraction, providing intuitive control signals.
To maximize the functionality of the interface, the magnets must be positioned in the severed muscles with good contractile capacity, following geometric placement rules defined in previous studies. To assist surgeons during this phase, a graphical user interface (GUI) was developed which integrates the patient's physiological data with specific technical requirements by processing magnetic resonance imaging (MRI), ultrasound (US), and EMG data acquired from the amputee.
Focusing on transradial amputations, the GUI virtually reconstructs the patient's forearm and maps the residual contractile ability of the muscles, providing both a graphical representation of the residual limb and quantitative information on muscle trophism. First, an MRI scan of the residual limb is performed. To align the MRI and US images, the latter are acquired using a linear probe combined with a tracking system including retro-reflective optical markers to record the relative position between the forearm and the probe, and the position of a landmark visible in the MRI image. With this setup, US images are acquired from each target muscle in both longitudinal and transverse sections and at different muscle levels: proximal, medial, and distal. Needle electrodes are used to collect EMG signals from the same muscles. The same measurements (US and EMG) are then taken from the corresponding muscles in the contralateral limb for comparison.
Once that the physiological data are available, they are loaded and processed by the GUI. First, the MRI images are processed through threshold-based segmentation to obtain the volume of the forearm. The 2D-US images are then combined with

the 3D-MRI images by aligning landmarks (e.g., the epicondyles) and the data from optical tracking, projecting the US images within the reconstructed volume through roto-translation operations. Subsequently, the 2D images are analyzed by the clinician, who assigns a value for muscle contraction and trophism by comparing them with images of the same muscle in the contralateral limb. This information is combined with EMG signal analysis data, which are also compared with data from the healthy limb. Ultimately, the US and EMG data allow for the calculation of the percentage reduction in muscle contraction in various sections of the severed muscles relative to healthy muscles.

Areas for future development include the automation of MRI image segmentation, the development of algorithms to detect muscle fiber displacement in US images, potential simplifications of the data acquisition setup, the need for large-scale validation of the system and, above all, the integration of a magnet-implant planning dedicated section. The proposed GUI meets the needs of the interdisciplinary team of surgeons and engineers, optimizing the functionality of the myokinetic prosthesis, simplifying intraoperative management, and improving the system customization process.

A-0074 PREDICTORS OF POOR POSTOPERATIVE OUTCOMES IN THORACIC OUTLET SYNDROME: A MULTIVARIATE ANALYSIS

Keigo Kimura[1], Taku Suzuki[1], Sakura Yamaguchi[1], Yutaro Sugiura[1], Yasuhiro Kiyota[1], Noboru Matsumura[1], Kazuki Sato[2], Takuji Iwamoto[1]

[1]Department of Orthopaedic Surgery, School of Medicine, Keio University, Tokyo, Japan; [2]Institute for Integrated Sports Medicine, Keio University School of Medicine, Tokyo, Japan

Objective: Few studies have identified factors associated with poor postoperative outcomes in thoracic outlet syndrome (TOS), and there is no consensus on these causative factors. Given that multiple factors may influence these outcomes, we conducted a multivariate analysis to identify predictors of poor postoperative outcomes in TOS patients treated at our department.

Subjects and Methods: This study included 62 patients with TOS (28 males, 34 females, mean age at surgery 39 years) who underwent first rib resection and were followed up for over one year. The surgical approaches included a video-assisted axillary approach in 23 cases and a video-assisted subclavian approach in 39 cases. We examined factors including gender, age, BMI, smoking history, preoperative DASH score, presence of subclavian artery stenosis as identified by contrast-enhanced CT, surgical approach, wait time from symptom onset to surgery, presence of psychiatric disorders, and comorbidities (e.g., cervical spine disease, cubital tunnel syndrome, and carpal tunnel syndrome) as potential risk factors for poor postoperative outcomes. Postoperative results one year after surgery were evaluated using the Derkash criteria, with outcomes classified as "excellent" and "good" for the favorable outcome group and "fair" and "poor" for the unfavorable outcome group. We performed univariate analysis with postoperative outcomes as the dependent variable and selected factors with a p-value < 0.2 for logistic regression analysis to identify predictors of poor postoperative outcomes.

Results: According to the Derkash criteria, postoperative outcomes were excellent in 33 cases, good in 16 cases, fair in 12 cases, and poor in 1 case. Univariate analysis showed that age, smoking history, preoperative DASH score, surgical approach, and presence of comorbidities were strongly associated with postoperative outcomes and were therefore included as candidate factors for logistic regression analysis. Logistic regression analysis identified a significant association between smoking history and poor postoperative outcomes (odds ratio: 0.33, 95% confidence interval: 0.11–0.92, $p = 0.03$).

Conclusion: Smoking history has been previously reported as a risk factor for poor postoperative outcomes in peripheral neuropathy and was also suggested as a predictor of poor outcomes in TOS.

A-0075 EXTRADIGITAL GLOMUS TUMOR

Barış Kafa, Erdi Şenyüz
Turkey

Glomus Tumor with Uncertain Malignant Potential in an Uncommon Location: A Case Report

Introduction: Glomus tumors are rare, benign soft tissue tumors arising from the glomus body, typically located in the subungual regions of digits, palms, and soles. These tumors constitute less than 2% of all soft tissue tumors and are primarily found in the hand, especially in the fingers, accounting for 75% of cases. Described initially by Wood in 1812, glomus tumors generally present as small, solitary, blue-red papules. Histologically, these tumors comprise three essential components: glomus cells, vasculature, and smooth muscle cells. Although benign, complete excision is advised to prevent recurrence.

Case Presentation: A 65-year-old male presented with a palpable mass on the ulnar aspect of his right wrist. The mass was well-defined, oval-shaped, and solid, measuring approximately 0.5 x 1 cm. He had surgery for the same mass at another hospital 1 year ago and the result was reported as lipoma. Physical examination confirmed a tender, painful firm lesion localized in the forearm, a less common site for glomus tumors. To characterize the lesion, ultrasound and MRI imaging were conducted. MRI findings revealed a well-defined, subcutaneous, oval-shaped lesion, homogeneously hyperintense on T2-weighted images with homogeneous enhancement, measuring 7 x 7 x 9 mm. The primary differential diagnosis included schwannoma or nerve sheath tumor due to the lesion's location and imaging characteristics. However, the definitive diagnosis required histopathological evaluation.

Management and Histopathological Findings: An excisional biopsy was performed to remove the lesion completely. Microscopic analysis revealed histopathological features consistent with a glomus tumor, including the presence of glomus cells, vascular components, and smooth muscle cells. The pathology report indicated elevated mitotic activity and a Ki-67 proliferation index, which suggested a diagnosis of "glomus tumor with uncertain malignant potential." No definitive findings of malignancy were observed, but the increased proliferative activity warranted a cautious interpretation.

Discussion: Glomus tumors outside typical subungual locations are rare and may present diagnostic challenges, often leading to an initial misdiagnosis as schwannoma or nerve sheath tumor. The unusual location of the tumor in this case—forearm rather than finger—contributed to diagnostic complexity. Surgical excision remains the treatment of choice for glomus tumors, and in this case, complete excision was achieved to minimize the risk of recurrence. The findings of increased mitotic activity and Ki-67 index may indicate a need for close follow-up, as these factors can sometimes correlate with more aggressive behavior.

Conclusion: This case highlights the atypical presentation of a glomus tumor in the forearm, emphasizing the importance of considering glomus tumors in differential diagnoses for wrist and forearm lesions. Complete excision remains the preferred treatment to prevent recurrence, and close observation is recommended in cases with uncertain malignant potential markers, as seen here with increased mitotic figures and a high Ki-67 index.

A-0076 CHANGES IN UPPER EXTREMITY COORDINATED MOVEMENTS DURING UPPER LIMB ROTATION IN PATIENTS WITH CARPAL TUNNEL SYNDROME

Eriku Yamada[1,2], Tomoyuki Kuroiwa[1], Toru Sasaki[1], Takuya Ibara[1], Akiko Yamamoto[1], Kazuya Tsukamoto[1], Tomohiko Waki[1], Koji Fujita[1]

[1]Institute of Science Tokyo, Tokyo, Japan; [2]Saitama Sekishinkai Hospital, Saitama, Japan

Background: Patients with carpal tunnel syndrome often complain of distant proximal symptoms such as shoulder or elbow pain, even though they do not have a clinical diagnosis of shoulder or elbow condition or disease. However, the underlying mechanisms remain unclear. This study hypothesized that compensatory movement of the proximal region results in these remote symptoms and aimed to investigate the differences in the coordinated movements of the upper arm and forearm in patients with carpal tunnel syndrome compared to those without it, using inertial measurement units.
Methods: The study included 13 patients with carpal tunnel syndrome (21 limbs) and 10 controls (20 limbs). Inertial measurement units were attached to the participants' upper arms and forearms, and the rotational range of motion and angular velocities of the two regions during upper limb rotation were assessed and statistically compared between the two groups.
Results: Although the total range of motion of the entire upper limb was not significantly different between the two groups, the carpal tunnel syndrome group exhibited significantly smaller proportions of range of rotational motion and external and internal angular velocities in the upper arm than those of the control group
Conclusions: We identified restricted static and dynamic rotational movements of the upper arm, suggesting alterations in coordinated movements and subsequent compensatory motions in patients with carpal tunnel syndrome. Understanding these motion irregularities may offer new perspectives on the etiology of proximal symptoms in carpal tunnel syndrome.

A-0077 GIANT CELL TUMOUR OF THE CARPAL BONES: 2 CASE PRESENTATIONS

Claire Sethu[1], Anthony Berger[2]

[1]John Radcliffe Hospital, Oxford, UK; [2]St Vincent's Hospital, Melbourne, Australia

Introduction: Giant cell tumour (GCT) is a rare benign bone tumour which is locally aggressive. It forms 5% of all primary bone tumours and 15-20% of all benign bone tumours. GCT of carpal bones is an even rarer entity, making up 0.2% of all GCT with the capitate and hamate comprising the vast majority. We would like to present 2 consecutive cases of GCT of the carpal bones.
Case Presentation:
Case 1
20 year old female presented with pain and swelling over the dorsum of her wrist with progressive stiffness. On examination she had no movement of her wrist with pain in all directions of motion. Diagnosis was delayed due to an initial diagnosis of Keinbock's disease being made. Imaging showed the total involvement of the lunate bone and biopsy confirmed GCT. A proximal row carpectomy was performed with no recurrence to date.
Case 2
A 35 year old male presented with pain over the dorsum of his wrist with tenderness on palpation over the capitate. Imaging and biopsy confirmed appearance of a giant cell tumour of the capitate. He underwent a curettage and bone grafting. His symptoms recurred within 3 months and subsequent imaging showed recurrence of the tumour with involvement of the hamate and the 3rd and 4th CMCJ. Staging scans did not show any metastases. He underwent an enbloc excision of the tumour with iliac bone grafting and fusion of the 3rd and 4th CMCJ.

Summary: GCT of the carpal bone is a rare entity which is locally aggressive with a high recurrence rate
Curettage and bone grafting carries a high recurrence risk ranging from 13-50% with enbloc excision having the lowest at 0-12%
Lesions within the hand have a greater risk of recurrence and metastases

A-0078 COMPLICATIONS OF TREATMENT IN CHILDREN WITH HAND FRACTURES IN FINLAND

Caroline Dikert[1], Petra Grahn[1], Yrjänä Nietosvaara[1,2]
[1]New Children's Hospital, Helsinki University Hospital, Helsinki, Finland; [2]Kuopio University Hospital, Kuopio, Finland

Hypotheses: The potential risks of treatment complications for pediatric hand fractures, including temporary discomfort and the possibility of permanent cosmetic or functional impairment, remain unknown. We hypothesized that permanent functional disability is low, and that most complications could be avoided by thorough initial evaluation.
Methods: The Finnish Patient Insurance Centre (PIC) gives monetary compensation for children that have sustained complications of treatment leading to excess pain or permanent disability. We evaluated all compensation claims related to the treatment of hand fractures in patients under the age of 16 in Finland from 1990 to 2020. Over the 30-year study period, the average annual census population of children was 985,029, with an estimated incidence rate of pediatric hand fractures of 350 per 100 000.
Results: A total of 101 children with hand fractures filed a claim to PIC concerning their treatment. Among them, 71 received compensation for a total of 72 treatment complications by 74 professionals. 43 compensated fractures were finger fractures, 15 metacarpal fractures and 14 scaphoideum fractures. One case, involving both a finger and metacarpal fracture, was grouped with finger fractures for analytic purposes. The calculated risk of a compensated complication of treatment in pediatric hand fractures in Finland was 0.1%. Most of the compensated treatment complications occurred in health care centers (n=37, 52%) by general practitioners (n=37, 52%)
The main cause for compensation was a delay in diagnosis (n=36), primary stemming from either the absence of a primary radiograph (n=23) or failure to detect the fracture in a radiograph (n=12). Scaphoideum fractures were especially prone to be misdiagnosed and posed the highest risk of leading to a permanent functional handicap following treatment complications (4/14). Nearly half of the patients (n=32, 45%) experienced a permanent cosmetic disability, while only eight received compensation for a permanent functional disability.
Summary points: Complications of treatment in pediatric hand fractures causing permanent functional disability are very rare in Finland. Most cases of delayed diagnosis and treatment could be avoided by taking a radiograph for diagnostic purposes.

A-0079 INCIDENCE AND FUNCTIONAL IMPACT OF RADIAL WRIST PAIN IN POSTPARTUM WOMEN DURING THE FIRST YEAR

Mireia Arlández[1], Hector Hormigó[2], Júlia Bou[2], Laura Rey[1], Marta Cuenca-Llavall[1]
[1]Xarxa Assistencial Universitaria de Manresa, Althaia, Spain; [2]Hospital Universitari d'Igualada, Spain

Introduction: De Quervain's tenosynovitis affects an estimated 1-3% of the general population, with higher prevalence among women, particularly in the postpartum period. Although it means a severe functional impairment in these women, limited data are available on its specific incidence and impact during the first postpartum year.

The aim of the present study is to evaluate the incidence of radial wrist pain in postpartum women and identifies associated risk factors.
Material & Methods: We conducted a prospective observational study including all patients who delivered at a district hospital from August 2021 to March 2022. Wrist pain incidence, pain localization for De Quervain's tenosynovitis, and associated risk factors—including maternal age, parity, and newborn birth weight—were assessed through telephone surveys. Functional limitations impairment was measured using the Visual Analog Scale (VAS), QuickDASH, and Patient-Rated Wrist Evaluation (PRWE) at 3, 6, 9, and 12 months postpartum.
Results: Among 186 women (mean age: 33 ± 5.41 years; mean parity: 1.78), 22.48% reported wrist pain at 3 months postpartum, with 20.42% localizing pain in the radial side of the wirst. Mean scores were 4.80 (± 2.65) on VAS, 22.62 (± 16.79) on QuickDASH, and 41.98 (± 33.53) on PRWE. Wrist pain incidence was 25.74%, 21.09%, and 19.27% at 6, 9, and 12 months, respectively, with 15.60% reporting radial wrist pain at 12 months. Mean scores at 12 months were 5.86 (± 2.73) on VAS, 32.51 (± 20.10) on QuickDASH, and 56.90 (± 32.67) on PRWE. Risk factors that have shown significant stadistical association with wrist pain are maternal age, increased newborn birth weight, and multiparity
Conclusions: Radial wrist pain in postpartum women shows a notable incidence and functional impact, with pain persisting up to one year postpartum. These findings highlight the need to identify risk factors and consider early preventive and therapeutic interventions in this population.

A-0080 THUMB CARPOMETACARPAL JOINT IMPLANT ARTHROPLASTY IS SAFE AND EFFECTIVE IN PATIENTS OVER THE AGE OF 80

Vanessa Reischenböck, Miriam Marks, Kei Mathis, Stephan Schindele, Daniel B Herren
Schulthess Klinik, Zurich, Switzerland

Aims: The efficacy of thumb carpometacarpal (CMC) implant arthroplasty in older patients is a topic of debate due to the potential impact of osteoporosis on implant integration. This study aimed to assess whether thumb CMC implant arthroplasty in patients over 80 years of age yields comparable one-year outcomes to those observed in patients between 60 and 70 years old.
Methods: The study population comprised patients who had undergone a thumb CMC implant arthroplasty (Touch®, KeriMedical, Switzerland) and who had been prospectively documented in a registry. A comparison was made between the one-year outcomes of patients aged 80 years and over (older patients) and those aged 60 to 70 years (younger patients). The primary outcome was pain during daily activities, measured on a 0-10 Numeric Rating Scale. Secondary outcomes included the brief Michigan Hand Outcomes Questionnaire (brief MHQ, score 0-100), key pinch strength and complications. The Mann-Whitney U test was employed to analyse the differences between the two groups.
Results: A total of 16 patients aged 80 years and over and 157 patients aged 60–70 years underwent thumb CMC implant arthroplasty between June 2018 and October 2023. One patient in the older cohort withdrew from the study due to dementia, while one patient in the younger cohort dropped out because of cup loosening and subsequent revision to resection arthroplasty.
This analysis included 15 patients aged 80–86 years and 156 patients aged 60–70 years. Before surgery, the mean pain score during daily activities was 7.4 (SD 1.7) in the older patient group and 7.1 (SD 1.7) in the younger patient group ($p=0.67$). At the one-year follow-up, pain had significantly decreased to 1.2 (SD 1.4) and 1.5 (SD 1.9) in older and younger patients, respectively, with no significant difference between the two groups ($p=0.71$). The one-year brief MHQ score was 80 (SD 19) and 85 (SD 18) for the older and younger patients, respectively, with a key pinch of 6.4 (SD 2.3) and 6.5 kg (SD 2.0), respectively ($p > 0.29$).

Patients in the older group did not experience any complications. In the younger cohort, three patients sustained an intraoperative fracture of the trapezium, which was successfully treated with a suture cerclage. Nineteen younger patients exhibited postoperative complications, with De Quervain tenosynovitis being the most prevalent complication (n=8), followed by trigger finger (n=5) and signs of implant loosening (n=4).
Conclusion: A comparison of the outcomes of patients aged 80 years and older with those of younger patients revealed no significant differences in pain, hand function, or grip strength at one-year post-surgery. No complications were observed in the older cohort. We therefore recommend thumb CMC implant arthroplasty for active patients over the age of 80.

A-0081 STABILITY OF THE DISTAL RADIOULNAR JOINT BEFORE AND AFTER CORRECTIVE OSTEOTOMY OF THE DISTAL RADIUS

Daniel Zobrist, Andreas Schweizer, Lisa Reissner
Balgrist University Hospital, Zurich, Switzerland

Malunion of the distal radius with dorsal angulation reduces stability of the distal radioulnar joint. The aim of the study was to sonographically quantify the stability of the distal radioulnar joint in 20 patients following corrective osteotomy of the distal radius and to investigate the subjective and clinical results preoperatively, three and twelve months postoperatively. Sonographically measured dorsovolar ulnar head translation relative to the distal radius was significantly higher (3.6 mm) preoperative compared to 2.9 mm three months postoperative. Twelve months postoperatively the result was 3.2 mm, similar to the contralateral side (3.2 mm). Pain, Disability of the Arm, Shoulder and Hand questionnaire and Patient-Reported Wrist Evaluations, wrist flexion, radial and ulnar inclination, grip strength and pronation and supination torque improved significantly. Corrective osteotomy of the distal radius shows good subjective and clinical results and improve the stability of the distalradioulnar joint sonographically measured.

A-0082 ADULT ULNAR PLASTIC BOWING SUCCESSFULLY TREATED WITH MANUAL REDUCTION TWO WEEKS AFTER INJURY

Yusuke Kido, Takashi Shimoe, Yuki Matsuyama, Hiroshi Yamada
Department of Orthopaedic Surgery, Wakayama Medical University, Wakayama City, Wakayama, Japan

Introduction: Acute plastic bowing (APB) of the ulna in adults is rarely reported and typically requires open reduction. When treatment is delayed, corrective osteotomy is often necessary, and permanent functional impairment can occur in some cases. We report a case of APB of the ulna in an adult successfully treated with manual reduction 2 weeks after the injury. Case report: A 21-year-old male sustained a roller injury to his right forearm. The previous physician diagnosed a fracture of the radial shaft, and internal fixation was performed on the 4th day after the injury. Postoperatively, the patient presented to our clinic on the 11th day after the injury with severe limitation of forearm rotation. Supination and pronation were -30 and 40 degrees (arc: 10 degrees), compared to 85 and 75 degrees (arc: 160 degrees) on the contralateral side. Tenderness was observed on the ulna at the same level as the radial fracture. X-ray showed a convex bowing deformity of the ulna, and T2-weighted MRI demonstrated high signal intensity at the tenderness point. Based on these findings, we diagnosed APB of the ulna. Additional surgery was planned on the 13th day after the injury, preparing for potential corrective osteotomy. We performed manual reduction under general anesthesia. An Esmarch bandage was applied to the convexity of the deformity, and gradual stretching was performed over approximately 30 minutes. Since the limitation

of forearm rotation had disappeared, no additional open reduction was applied. Full range of motion maintained 2 years postoperatively with a return to original occupation.
Discussion: APB of the forearm in adults has been reported in patients up to 30 years old. Unlike pediatric cases, which occur from axial loading of 100-150% body weight, APB in adults is caused by slow and strong lateral compression. Previous reports recommend attempting manual reduction within 1 week in pediatric cases; however, our case suggests that gradual manual reduction may be effective even up to 2 weeks after injury in adults. Although complete radiographic correction was not achieved, the functional outcome was satisfactory, indicating that residual deformity may be acceptable if range of motion is restored. In our case, the key to successful reduction was the gradual stretching applied over 30 minutes under general anesthesia.

A-0083 DISTAL RADIUS CORRECTIVE OSTEOTOMY WITH OR WITHOUT BONE GRAFTING: INTERIM RESULTS FROM A MULTICENTER RCT STUDY

Pascal Hannemann, Dominique Disseldorp, Jan Ten Bosch, Martijn Poeze
Maastricht University Medical Center, Maastricht, Netherlands

Introduction: Open wedge osteotomy with bone grafting from the iliac crest is considered the standard treatment for distal radius malunions. However, small retrospective studies suggest that bone grafting may not always be necessary. Our multicenter prospective randomized trial aims to compare both treatment options by analyzing various outcome measures.
Method: Patients aged 18 years or older with an extra-articular malunion that were planned for corrective osteotomy were included and randomized for treatment with or without bone graft from the iliac crest. The follow-up period was one year with five measurement points. Primary outcomes were complications and quality of life, while secondary outcomes included time to complete bone healing, cost-effectiveness, objective and subjective functional outcomes (PRWE, DASH, EQ-5D-5L, VAS, wrist function). Currently, 31 patients have completed one-year follow-up.
Results: After one year of follow-up, no significant differences were found in quality of life or functional outcomes. Two patients experienced complications at the iliac crest: chronic pain and hypesthesia. Complete bone healing occurred in the group without bone grafting after 177 days and in the group with bone grafting after 223 days (P 0.38). The group without bone grafting demonstrated a higher QALY (0.80 vs. 0.68) and lower total treatment costs (€7,839 vs. €10,302).
Conclusion: Based on preliminary results, corrective osteotomy without filling the osteotomy defect appears to be the preferred treatment. This approach is cost-saving, yields a higher QALY, and presents no adverse clinical outcomes for the patient.

A-0084 SUTURE-BUTTON SUSPENSIONPLASTY (SBS) FOR THUMB CARPOMETACARPAL ARTHRITIS: COMPARISON BETWEEN SBS AFTER ARTHROSCOPIC HEMITRAPEZIECTOMY AND SBS AFTER OPEN TOTAL TRAPEZIECTOMY

Yasuhiro Kiyota[1], Taku Suzuki[1], Masanori Nakayama[2], Noboru Matsumura[1], Kazuki Sato[3], Takuji Iwamoto[1]
[1]Department of Orthopaedic Surgery, Keio University School of Medicine, Tokyo, Japan; [2]Department of Orthopaedic Surgery, School of Medicine, International University of Health and Welfare, Chiba, Japan; [3]Institute for Integrated Sports Medicine, Keio University School of Medicine, Tokyo, Japan

Introduction: Since the successful short-term outcomes of suture-button suspensionplasty (SBS) for thumb carpometacarpal arthritis were reported, we adopted SBS as the primary surgical option. Either SBS with arthroscopic hemitrapeziectomy (arthroscopic SBS) or SBS with open total trapeziectomy (open SBS) was performed depending on the surgeon's treatment plan. This study aims to compare the outcomes of these two surgical techniques.

Materials & Methods: We have performed SBS in patients with Eaton classification 2 or 3 thumb carpometacarpal arthritis since 2017. We analyzed 21 hands (21 cases) treated with arthroscopic SBS (4 males, 17 females; mean age: 69 years) and 19 hands (19 cases) treated with open SBS (3 males, 16 females; mean age: 72 years). Patients with connective tissue diseases or those undergoing reoperations were excluded, and all included cases were followed for more than one year. In the arthroscopic SBS group, hemitrapeziectomy (3 mm from the tapeziometacarpal joint line) was performed arthroscopically, while in the open SBS group, total trapeziectomy was conducted. In both groups, the first and second metacarpals were fixed using the Mini TightRope CMC ® (Arthrex, Inc., Naples, FL, USA). Clinical outcomes and the trapezial space ratio (TSR) on plain radiographs were compared at one year postoperatively.
Results: Pain during motion, as measured by visual analogue scale (VAS), showed significant improvement in both the arthroscopic SBS group (preoperative: 67, postoperative: 7) and the open SBS group (preoperative: 66, postoperative: 7). No significant differences were observed in grip strength, lateral pinch strength and Kapandji score between the preoperative and postoperative periods. The TSR values for the arthroscopic SBS group were maintained (preoperative: 0.40, postoperative: 0.39), whereas the open SBS group exhibited a significant reduction from 0.38 preoperatively to 0.17 postoperatively, indicating a significant difference between the groups ($p < 0.001$). The operative time for arthroscopic SBS (104 minutes) was significantly longer than that for open SBS (80 minutes) ($p < 0.001$)
Conclusions: Both arthroscopic SBS and open SBS yielded favorable clinical outcomes at one year postoperatively, with no significant differences between the two groups. Although the extended operative time is a concern, the preservation of the trapezial space was superior in the arthroscopic SBS group. Further investigation is needed to determine whether the preservation of the trapezial space is due to the ligament-preserving nature of the arthroscopic procedure or the partial resection of the trapezium.

A-0085 FUNGAL FLEXOR TENOSYNOVITIS IN THE HAND: AN UNCOMMON CLINICAL CHALLENGE

Marta Cuenca-Llavall, Claudia Sala, Laura Rey, Albert Pons, Mireia Arlández, Jordi Saus
Xarxa Assistencial Universitària de Manresa, Althaia

Fungal infections involving the upper extremity, particularly fungal flexor tenosynovitis, remain uncommon but diagnostically challenging entities, with rising incidence among immunocompromised patients. The aim is to present a rare case of fungal flexor tenosynovitis in a 66-year-old male with rheumatoid arthritis on long-term immunosuppressive therapy, who developed a dual fungal infection involving Actinomyces timonensis and *Fusarium.
The patient presented with a three-week history of progressive swelling and a cystic lesion over the volar aspect of the third digit, accompanied by diminished range of motion. Initial workup included aspiration of purulent material, while MRI confirmed severe flexor tenosynovitis.
Operative exploration via a volar approach, extending from the distal interphalangeal joint to the radiocarpal fold, revealed a complete rupture of the third finger's flexor digitorum superficialis and profundus tendons, as well as rupture of the fifth common flexor tendon, necessitating resection. Postoperative wound dehiscence required a secondary debridement, with subsequent cultures yielding Actinomyces and Stenotrophomonas. The patient was managed with extended, culture-directed antifungal therapy tailored to the microbiological profile, continuing for six months postoperatively.
At follow-up, the patient demonstrated favorable wound healing without inflammatory sequelae, preserved passive joint mobility, and adaptation to daily function with a proximal interphalangeal extension block splint. The patient elected to defer flexor tendon reconstruction at this time.
This case underscores the need for early, aggressive surgical debridement paired with prolonged antifungal therapy in

immunocompromised patients with fungal hand infections. Further studies are warranted to establish standardized protocols for managing fungal tenosynovitis in this vulnerable population.

A-0086 LATERAL ELBOW MAGNETIC RESONANCE IMAGING FINDINGS IN PATIENTS WITHOUT PAIN COMPLAINTS

Masaomi Saeki, Hidemasa Yoneda, Katsuhiro Tokutake, Michiro Yamamoto
Nagoya University Graduate School of Medicine, Nagoya, Japan

Background: Magnetic resonance imaging (MRI) can help evaluate lateral epicondylitis; however, abnormal findings on MRI are not always consistent with the symptoms. The occurrence of such abnormal MRI findings at the lateral side of the elbow in patients without pain remains unclear. Therefore, the purpose of this study was to investigate the MRI findings of the lateral elbow joint in patients with no complaints of pain in the elbow joint.
Methods: We retrospectively identified 152 patients who had undergone MRI of the area including the elbow from July 2015 to January 2022. We excluded patients with pain in the elbow area and those with diagnoses of diseases that could affect MRI findings at the lateral elbow. The presence of lateral collateral ligament complex (LCLC) and common extensor tendon (CET) lesions on MRI was assessed by two reviewers.
Results: In total, 22 patients (12 men and 10 women) were included in the analysis. The mean age of the patients was 54 years. Five patients, all ≥65 years old, had abnormal findings related to the LCLC or CET on MRI
Conclusions: Abnormal LCLC and CET findings on MRI can be encountered in older patients even in the absence of elbow pain.
Keywords: Lateral elbow; Lateral epicondylitis; Lesion; Magnetic resonance imaging; No elbow pain.

A-0087 AXON COUNT IN BRACHIAL PLEXUS NERVES: A SYSTEMATIC REVIEW REVEALING SIGNIFICANT VARIATIONS ACROSS STUDIES

Mauro Maniglio[1], Nick Haydon[2], Simon Roner[3], Heather Baltzer[4]
[1]Department of Hand Surgery, The Balgrist, University Clinic, Zürich, Switzerland; [2]Department of Plastic Surgery, North Shore Private Hospital, Sydney, Australia; [3]Department of Hand and plastic Surgery, University Hospital Zurich, Zürich, Switzerland; [4]Department of Hand and plastic Surgery, Toronto Western Hospital, UHN University of Toronto, Toronto ON, Canada

Introduction: A key factor in planning nerve transfers is matching axon counts between donor and recipient nerves. Axon counts in the literature vary by source and method, and no single source summarizes all brachial plexus nerves. This review aims to compile these counts in one article and assess comparability across studies.
Methods: A systemic review of the literature was conducted according to the PRISMA guidelines. The databases pubmed, Medline, Ovid and Embase were assessed using all different variations of the terms "nerve axon count* AND “upper extremity"; inter-changing the first term with “axon count*” ; “myelinated fibers count*”; “nerve transfer” and the second term with “brachial plexus” and “arm”. A total of 539 articles were found and screened, assessing the articles titles and abstracts. A total of 57 articles were selected and 19 articles were added through the reference list for a full text assessment, after which we retained 54 articles.
For these articles the axon counts, SD, and ranges were collected for all upper extremities’ nerves. A metanalysis was performed, if more than one article counted the axons of a specific nerve and if the difference between the counts were less than 100%. In this case an average count was calculated.
Results: In the 54 articles a total of 12 nerves and 44 muscle branches were assessed. Axon counts of 4 nerves and 14 branches were done only in a single study. In the comparison between the axon counts, in 4 nerves and 16 nerve branches,

the difference excided 100% between the highest and lowest value. For 5 nerves and 11 branches a metanalysis could been performed. This metanalysis is summarized and presented in the article.
Discussion: We summarize the different axon counts found in the literature and performed a metanalysis were possible. Our study revealed enormous differences in between axon counts across various studies, reaching up to a factor of 87 between averages. Additionally, the quality of the methods of these studies varies, particularly since axon count is frequently reported as a secondary or tertiary outcome
Conclusions: In addition to describing upper limb axon counts, the authors found low comparability between studies. This insight cautions surgeons against using axon counts from studies with differing methodologies to plan nerve transfers.

A-0088 RECONSTRUCTION OF SINGLE OR MULTIPLES PULLEYS IN CLIMBERS AND NONE CLIMBERS AFTER TRAUMATIC AND IATROGENIC INJURIES. A CASE SERIES OF 23 CASES

Mauro Maniglio, Christina Wanivenhaus, Lea Estermann, Andreas Weber, Andreas Schweizer
The Balgrist, University Clinic Zürich, Switzerland

Purpose: The pulley system is a fibro-osseous structure that allows biomechanical tendon gliding efficiency and nutrition [1]. There are open and closed pulley injuries. Acute, closed injuries can mostly be treated conservatively. In case of chronic lesions the Pulleys should be reconstructed to correct bowstringing and flexion lag. This type of surgery is challenging and the evidence in the literature is limited to case reports and small case series.
We want to describe a new technique of Pulley reconstruction using a tendon graft anchored in the remnants of the pulleys and present our case series of 23 patients.
Methods: 23 patients with a mean age of 38 years after iatrogenic or traumatic rupture of one or more adjacent flexor tendon pulleys in the finger and distal palm, were treated with a pulley reconstruction with an autologous tendon graft. The minimum follow-up was 1 year. Outcome measures were collected pre-operative and at end of follow-up, including the presence of Bowstringing, flexion contractures, ROM, pain, satisfaction, and Jamar grip strength, compared to the uninjured side.
An ultrasound was performed to measure the distance in between the phalanx and the tendons to quantify the bowstringing, these measurements were repeated at the end of follow-up
Results: Mean time between injury and surgery was 22 months. Pre-operative all patients had a bowstringing and 68% had a contracture of at least one finger joint (mostly the PIP). In 9 patients the A1 was reconstructed, in 22 patients the A2, in 9 the A3 and in 11 the A4. In 5 patients only one pulley was reconstructed, in contrast to the other 18 where two or more pulleys were reconstructed. In all patients but one, the bowstringing could be corrected. The average flexion contracture could be reduced from 30° to 11°. A ROM in flexion/extension of average 79° were achieved. Grip strength on the Jamar Dynamometer showed only a slight reduction of 11% compared to the uninjured side. All patients but one were very satisfied or satisfied of the final result.
Conclusion: The reconstruction of single of multiple flexor tendon pulley using our reconstruction technique anchored in the remnants of the insufficient pulley, showed a successful correction of the bowstringing and an improve in finger function leading to high patient satisfaction.

A-0089 3D-GUIDED VS. TRADITIONAL RECONSTRUCTION FOR SCAPHOID MALUNION AND NONUNION: A COMPARATIVE STUDY

Mauro Maniglio[1], Benedikt Jochum[2], Andreas Schweizer[1]
[1]Department of Handsurgery, The Balgrist, University Clinic Zürich, Switzerland; [2]Department of Handsurgery, KSSG, Cantonal Hospital St. Gallen, Switzerland

Purpose: The treatment of Scaphoid malunion or malpositioned non-unions is challenging. To reconstruct the exact shape of this complex three-dimensional bone is difficult, but crucial for the wrist biomechanics. Therefore, the use of 3D planning and 3D printed guides can be an important advancement in the precision of these surgeries and therefore also for the clinical result of the affected patients. We want to present our results of patient treated with this 3D technique and compare them to a historical cohort treated with conventional Scaphoid reconstruction.
Methods: 64 patient (average age 29y, 45 male) with a scaphoid non-unions (50), delayed-union (10) or malunion (4) were treated with a 3D guided scaphoid reconstruction. The intended correction of the malposition, reduction and fixation was planned based on a bilateral wrist CT-scan with the mirrored contralateral scaphoid as a template. The scaphoid reconstruction was then performed using custom-made 3D-printed guides. The clinical results were collected for union, VAS, ROM and grip strength. We used the mirrored 3-dimensional model of the healthy scaphoid to access the achieved correction of the fragment from prereduction to postreduction. The clinical results were then compared to the results of a historical cohort of 53 conventionally treated scaphoids.
Results: We are currently collecting the outcomes and finalizing the results
Conclusions: It would be a great pleasure to present our results of this comparative cohort study at the FESSH meeting in Helsinki!

A-0090 WHICH SERUM BIOMARKERS PREDICT PATIENT-REPORTED OUTCOMES AFTER TREATMENT FOR CARPOMETACARPAL ARTHRITIS? A MACHINE LEARNING-BASED BIOMARKER STUDY

Mauro Maniglio[1], Moaath Saggaf[2], Daniel Antflek[2], Jason Rockel[3], Mohit Kapoor[3], Heather Baltzer[2]
[1]Department of Hand Surgery, The Balgrist, University Clinic, Zürich, Switzerland; [2]Toronto Western Hospital, Toronto, Canada; [3]Krembil Arthritis Research Institut, Canada

Introduction: First carpometacarpal osteoarthritis (CMC 1 OA) is one of the most frequent joints affected by OA in the hand. Different potential biomarkers are targets of research and advances in OA in general, but few studies focus on hand OA. This study aimed to identify systemic biomarkers in patients with CMC 1 OA at baseline that predict patient-reported outcomes one year after treatment. We hypothesized that baseline systemic biomarkers can predict patient-reported outcomes.
Methods: Prospectively collected blood samples and clinical data from 143 patients treated for CMC 1 arthritis with a conservative therapy, fat grafting or trapeziectomy were collected at baseline with follow-up at three months, six months and one year. Supervised machine learning methods using Lasso regularization were applied to the dataset to identify associations among 10 systemic biomarkers known to contribute to cartilage turnover, bone remodelling, pain transmission or lipid metabolism. The model was internally validated using 10-fold cross-validation and included Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH), pain visual analogue scale (VAS) and the Trapeziometacarpal Arthrosis Symptoms and Disability (TASD) questionnaire outcome measures. Generalized estimating equation models were built for each outcome to assess the association between identified baseline biomarkers and 1-year outcomes accounting for age, sex, body mass index, time and treatment.

Results: Mean age of the 143 patients was 61± 8 years (mean±SD), and 99 patients (69 %) were female. The majority of patients were treated conservatively (n=68, 47%), followed by trapeziectomy (n=54, 38%) and fat grafting (n=21, 15%). The supervised machine learning model identified associations between several outcomes and N-propeptide of collagen IIA (PIIANP), visfatin, adiponectin and leptin. In the adjusted analyses, baseline PIIANP was associated with improvements in VAS (beta = -3.09, 95% CI: -6.07 to -0.11, P=0.04), QuickDASH (beta =-3.99 95% CI: -5.98 to -1.99, P<0.0001) and TASD (beta = -2.42, 95% CI: -4.51 to -0.33, P=0.02) outcome measures longitudinally. Visfatin was associated with worsening in the VAS outcome measure (beta = 3.04, 95% CI: 0.14 to 5.93, P=0.04)

Conclusions: Baseline PIIANP is associated with an improvement in the clinical outcome while baseline visfatin is associated with worsening of CMC 1 OA outcomes up one year following treatment. These two biomarkers or a combination of both may be useful to predict patient specific outcome after treatment of CMC 1 OA.

A-0091 IS REPLANTATION ASSOCIATED WITH BETTER HAND FUNCTION AFTER TRAUMATIC HAND AMPUTATION THAN AFTER REVISION AMPUTATION?

Joonas Pyörny[1], Patrick Luukinen[2], Ida Neergård Sletten[3], Aleksi Reito[2], Olli Leppänen[2], Jarkko Jokihaara[1,2]

[1]Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland; [2]Center for Musculoskeletal Diseases, Tampere University Hospital, Tampere, Finland; [3]Division of Orthopaedic Surgery, Oslo University Hospital, Oslo, Norway

Background: Replantation is an established treatment for traumatic upper extremity amputation. Only a few studies, however, have assessed the patient-reported outcomes of replantation, and the findings of these studies have been conflicting.

Questions: (1) Is replantation associated with better hand function than revision amputation? (2) Is replantation associated with better health-related quality of life, less painful cold intolerance, and more pleasing hand esthetics than revision amputation after a traumatic hand amputation?

Methods: In this retrospective, comparative study, we collected the details of all patients who sustained a traumatic upper extremity amputation and were treated at the study hospital. Between 2009 and 2019, we treated 2250 patients, and we considered all patients who sustained a traumatic amputation of two or more digital rays or a thumb as potentially eligible. Based on that, 15% (334 of 2250) were eligible; a further 2% (8 of 334) were excluded because of a subsequent new traumatic amputation or bilateral amputation, and another 22% (72 of 334) refused participation, leaving 76% (254 of 334) for analysis here. The primary outcome was the DASH score. Secondary outcomes included health-related quality of life (EuroQOL-5D [EQ-5D-5L] Index), painful cold intolerance (the Cold Intolerance Symptom Severity score), and hand esthetics (the Michigan Hand Questionnaire aesthetic domain score). The minimum follow-up time for inclusion was 18 months. Patients were classified into two treatment groups: replantation (67% [171 of 254], including successful replantation in 84% [144 of 171] and partially successful replantation in 16% [27 of 171], in which some but not all of the replanted tissue survived), and revision (complete) amputation (33% [83 of 254], including primary revision amputation in 70% [58 of 83] and unsuccessful replantation followed by secondary amputation in 30% [25 of 83]).

Results: After controlling for potential confounding variables such as age, injury type, extent of tissue loss before treatment, and accident of the dominant hand, replantation was not associated with better DASH scores than revision amputation (OR 0.82 [95% confidence interval (CI) 0.50 to 1.33]; p = 0.42). After controlling for potential confounding variables, replantation was not associated with better EQ-5D-5L Index scores (OR 0.93 [95% CI 0.56 to 1.55]; p = 0.55), differences in Cold Intolerance Symptom Severity scores (OR 0.85 [95% CI 0.51 to 1.44]; p = 0.79), or superior Michigan Hand Questionnaire esthetic domain scores (OR 0.73 [95% CI 0.43 to 1.26]; p = 0.26) compared with revision amputation.

Conclusion: Replantation surgery was conducted, if feasible, in a homogenous cohort of patients who underwent amputation. If the amputated tissue was too severely damaged or replantation surgery was unsuccessful, the treatment resulted in revision (complete) amputation, which was not associated with worse patient-reported outcomes than successful replantation. These results contradict the assumed benefits of replantation surgery and indicate the need for credible evidence to better guide the care of these patients.

A-0092 COMPUTER 3D PREOPERATIVE PLANNING AND ARTHROSCOPIC ASSISTED CORRECTIVE OSTEOTOMY FOR INTRA AND EXTRA-ARTICULAR OF DISTAL RADIUS MALUNION

Juitien Shih
Armed Forces Taoyuan General Hospital, Taoyuan, Taiwan

This study evaluates the improvement of wrist function post-3D printer combined with arthroscopy to intra and extra-articular corrective osteotomy for malunion of distal radius. From 2018 to 2022, there were 19 patients (15 male, 4 female) with intra and extra-articular fractures of the distal radius and malunion were collected. They all underwent preoperative planning via a computer 3-D printer combined with arthroscopic intraarticular corrective osteotomy and reduction with internal fixation. Data were obtained through medical records and radiographic review. Intraoperative and immediate postoperative X-rays were compared with the final X-rays. healing, confirmed radiographically, was used to determine whether the device and internal fixation were adequate for fixation. All malunion of fractures were corrective and healed by an average of 7.5 weeks (range, 5–14 weeks) without loss of fixation or malunion again. All patients have regular follow-ups around 20-30 months (mean 25.2 m). Eighteen of nineteen patients improved wrist function to good or excellent by the scores of Modified Wrist Scores. The computer-assisted 3D planning technique led to significant improvement in all affected radius positioning parameters. Furthermore, the postoperative values and 3D preoperative planning values did not differ. The arthroscopy can help find the old fracture site and make good intraarticular osteotomy combined with a 3-D printer jig. Meanwhile, perfect reduction can occur and any soft tissue lesion could be checked. This is an effective method to correct the intra and extra-articular malunion of the distal radius.

A-0093 RISK FACTORS FOR DISTAL RADIUS FRACTURE

Takahiro Sato[1], Hiroki Ito[2], Tsuyoshi Shirahata[3], Yusuke Yuasa[3], Naohisa Myakoshi[3]
[1]Department of Orthopedic Surgery, Kitaakita Municipal Hospital, Akita, Japan; [2]Department of Orthopedic Surgery, Noshiro Kousei Medical Center, Akita, Japan; [3]Department of Orthopedic Surgery, Akita University Graduate School of Medicine, Akita, Japan

Objective: Distal radius fractures (DRF) are significant sentinel events in fragility fractures. This study aims to identify factors associated with DRF occurrence, focusing on bone mineral density (BMD) and muscle mass.
Methods: A retrospective study was conducted in a single regional center. Thirty female patients diagnosed with DRF between January 2017 and March 2024, who had BMD and muscle mass measurements taken within one-year post-injury (mean age 70.8 years, body mass index 23.6), were categorized into the DRF (+) group. For a control group, 51 females without a history of osteoporosis treatment or fragility fractures, who had BMD and muscle mass measurements between June 2021 and March 2024 (mean age 67.2 years, body mass index 23.5), were collected as the DRF (-) group. Using dual-energy X-ray absorptiometry to measure the percentage of young adult mean (YAM) for the areal BMD and

bioelectrical impedance analysis to assess muscle mass, we calculated YAM in the lumbar spine (LS), YAM in the femoral neck (FN), skeletal muscle index (SMI), and trunk muscle index (TMI) for both groups and performed statistical analysis
Results: YAM in the LS was DRF (+): 80% (62–100, Min-Max) and DRF (-): 88% (55–126, Min-Max), and YAM in the FN was DRF (+): 74 ± 11.7% (mean± standard deviation: SD) and DRF (-): 82.7 ± 13.2% (mean± SD), showing significant differences ($p < 0.01$, $p = 0.03$). SMI were DRF (+): 6.42 ± 0.77 and DRF (-): 6.45 ± 0.71 (mean± SD), and TMI were DRF (+): 8.66 (7.2–10, Min-Max) and DRF (-): 8.73 (7.8–9.6 Min-Max), with no significant differences ($p = 0.85$, 0.19). Multivariate logistic regression analysis indicated a significant association between YAM in the LS and DRF occurrence (odds ratio 0.95, 95% confidence interval 0.92–0.99, $p < 0.01$). Weak positive correlations were observed between SMI, TMI, and YAM in the LS or FN: SMI and YAM in the LS ($r = 0.32$, $p < 0.01$), SMI and YAM in the FN ($r = 0.33$, $p < 0.01$), TMI and YAM in the LS ($r = 0.21$, $p = 0.06$), and TMI and YAM in the FN ($r = 0.26$, $p = 0.02$).
Discussion: YAM in the LS was significantly associated with DRF occurrence. The lack of significant differences in muscle mass may be due to the typical age of DRF occurrence being younger than that of sarcopenia onset. However, despite the lack of significance, correlation analysis suggests that severe BMD decline may accompany muscle mass reduction, potentially elevating fracture risk substantially.
Conclusion: Decreased BMD, especially in lumbar spine, was more associated with DRF occurrence than muscle mass decline.

A-0094 TRAPEZIECTOMY WITH A DORSAL DISTALLY BASED CAPSULAR INTERPOSITION FLAP ARTHROPLASTY: SURGICAL TECHNIQUE AND CLINICAL OUTCOMES

Georgios Mazis[1,2], Lilanthi Fitzmaurice[1], Eskarlet Pereira[1], Kuen Foo Chin[1], Amit Thakrar[1], Panagiotis Pantos[2](1), Queen's Hospital BHR University Hospitals NHS Trust, UK[2], Athens Medical Centre, Greece
[1]Queen's Hospital BHR University Hospitals NHS Trust, UK; [2]Athens Medical Centre, Greece

Background: First carpometacarpal joint (1st CMCJ) arthritis is a common condition with a reported prevalence of 11%. When conservative measures fail, patients with ongoing symptoms regularly require surgical treatment. Current literature doesn't favour one type of procedure over others based on patient outcome.
We describe a procedure consisting of an excision of the trapezium while preserving a distally based capsular flap used as an interposition graft. We present a retrospective study assessing the outcomes of this technique.
Method: We followed up 19 patients who had the same operation performed by a single surgeon over the course of 31 months. We collected data including pincer grip measurement, DASH, Kapanji, VAS scores and Patient Satisfaction score
Results: There were 15 female patients and four males patients.Post-operative mean Kapandji score was 9.6/10 (9-10, SD 0.48); mean DASH score was 21.7/100 (20.75-22.5, SD 0.67); mean VAS pain score was 1.05/10 (0-3, SD 0.7).Post-operative mean grip strength in the operated hand was 14.7 Kg (8.0-25.8 Kg, SD 4.8). There was no significant difference between grip strengths in the operated and unoperated hands ($P = 0.2660$). Self-reported patient satisfaction was either "Good" (63%) or "Excellent" (37%).
Conclusion: The current literature does not favour one form of surgical procedure over another for the treatment of 1st CMCJ arthritis. Our results show the procedure as described provides a satisfactory outcome, with low complication rates in the studied cohort of patients.

A-0095 SYMPTOMATIC RADIAL-SIDED TEARS OF THE TRIANGULAR FIBROCARTILAGE COMPLEX: AN ALL-ARTHROSCOPIC REPAIR USING BONE ANCHORS

Suraj Sajeev, Muntasir Mannan Choudhury
Sengkang General Hospital, Singapore

Radial-sided tears of the triangular fibrocartilage, though uncommon, can still be a reason for ulnar-sided wrist pain, and, at times, instability of the distal radioulnar joint.
Historically, it has been believed that because of the paucity of vascularity along the radial edge of the triangular fibrocartilage complex (TFCC), any form of repair will not lead to healing, thus stating it to be an exercise in futility. Current literature deftly argues against this previously prevailing concept and supports the need of repair in case of symptomatic radial-sided TFCC tears. In our study, we describe an all arthroscopic technique of repairing radial-sided tears using a bone anchor which can be a fast and simple procedure in the hands of an orthopaedic or hand surgeon trained in arthroscopy. This technique also circumvents the risk of injuring the superficial radial nerve and other radial-sided structures which are stated complications of the current arthroscopic repairs.

A-0096 ARTHROSCOPIC WAFER PROCEDURE FOR ULNAR IMPACTION SYNDROME IN AN INTACT TRIANGULAR FIBROCARTILAGE COMPLEX

Suraj Sajeev, Muntasir Mannan Choudhury
Sengkang General Hospital, Singapore

The two classical surgical methods used to address ulnar impaction syndrome are ulnar shortening osteotomy and the wafer procedure, which can either be open or arthroscopic. With the advent of arthroscopy, with surgeon harboring arthroscopy skills, arthroscopic wafer resection has been intensely popularized which requires a central perforation of the triangular fibrocartilage to approach the ulna dome through the ulnocarpal joint.
So, what happens in symptomatic patients with ulnocarpal abutment with an intact triangular fibrocartilage complex who have failed conservative management. Do we perform an open procedure or do we create a perforation in the central disc of the triangular fibrocartilage complex to expose the ulnar dome? Or do we just do an ulnar shortening osteotomy? Here, we describe our arthroscopic technique of conducting arthroscopy in the narrow confines of the space below the triangular fibrocartilage complex above the ulnar dome to carry out an arthroscopic wafer procedure in a triangular fibrocartilage complex with no central perforation. The procedure can produce results similar to those of the classical arthroscopic wafer procedure described explicitly in the literature.

A-0097 SHORT-AND-MID TERM RESULTS OF DISTAL RADIOULNAR JOINT ARTHROPLASTY WITH EXTENSOR TENDON RUPTURE USING MINIMUM DARRACH METHOD

Hirotaka Sugiura, Katsuhiro Tokutake, Michiro Yamamoto
Nagoya University, Nagoya, Japan

Introduction: For distal radioulnar joint disorders with subcutaneous rupture of the extensor tendon that occurred when wrist pain was not a problem in daily life, we have selected the modified Darrach technique, which involves minimal resection of the protruding ulnar head and sigmoid notch, repairing the joint capsule, and placing the extensor

retinaculum under the reconstructed extensor tendon to prevent re-rupture. Although this technique has the advantage of being simple and reducing the burden on the patient, the prognosis, such as re-rupture, reoperation, and worsening wrist pain, is unknown. The purpose of this study is to investigate re-rupture, reoperation, and wrist pain in the short and medium term after this technique.
Subjects and Methods: The subjects were 18 cases of extensor tendon rupture caused by distal radioulnar joint disorders that underwent the modified Darrach technique and tendon transfer from 2003 to 2023 and have been followed for more than six months. Cases whose follow-up had been completed were surveyed by telephone. Survey items included whether the reconstructed extensor tendon had re-ruptured, whether the patient had undergone reoperation on the wrist or tendon, and whether the patient currently had wrist pain.
Results: Twelve patients were available for survey, excluding six patients who could not be reached by phone or who had already died. The average age at the time of surgery was 59 years (range, 29-81 years). The average follow-up period after surgery was 7 years (range, 0.5-18.0 years), and there were no cases of re-rupture or reoperation. Five patients experienced wrist pain, but none of them experienced constant pain and did not cause any inconvenience in daily life.
Conclusion: Although longer-term surveys are necessary, this method can be expected to provide a stable postoperative course in the short to medium term, and it can be said to be a minimally invasive surgical method that is directly linked to the main complaint of patients who visit the hospital.

A-0098 AN ALL-ARTHROSCOPIC TECHNIQUE OF REPAIR OF SUBSTANCE TEARS OF THE TRIANGULAR FIBROCARTILAGE COMPLEX IN SYMPTOMATIC PATIENTS

Suraj Sajeev, Muntasir Mannan Choudhury
Sengkang General Hospital, Singapore

Substance tears of the triangular fibrocartilage complex (TFCC) can occur secondary to trauma of the wrist. On the dorsal periphery, they are considered Palmer 1B tears or Atzei class 1 tears. If along the radial side, they can manifest as a tear of the central disc, classified as a Palmar class 1A tear. If it involves the ligaments, it is stated as a pre-1D tear as per the new classification system by Luchetti and colleagues. Multiple excellent repair techniques exist in the current literature for dorsal peripheral tears and even for those in the substance of the TFCC, whereas there are successful evolving techniques of repair of avulsed tears and those involving the substance of the ligaments on the radial side adjacent to the sigmoid notch. Here, we describe our technique of repairing substance tears of the TFCC arthroscopically without the need for any specialized equipment apart from the basic arthroscopy set. The technique was conducted in a patient with a transverse substance tear on the radial side of the triangular fibrocartilage involving the central disc with complete resolution of symptoms. It is a simple technique, which can be used to repair class 1B peripheral tears and pre-1D tears in the substance of the TFCC.

A-0099 PERCUTANEOUS RELEASE OF TRIGGER FINGER IN A FLEXED POSITION - SURGICAL TECHNIQUE

Suraj Sajeev, Dawn Chia
Sengkang General Hospital, Singapore

Percutaneous trigger finger release is a minimally invasive surgical procedure which offers advantages of reduced surgical trauma, minimal scarring and earlier return to work. Intraoperative incomplete release may necessitate conversion to an open surgical technique. To address this challenge, we propose a modified percutaneous release technique with the

flexed locked position of the affected finger. The advantage of this technique is quicker surgical time and better functional release of of the trigger without excessive tendon damage

A-0100 COMPARISON OF CONSERVATIVE AND SURGICAL TREATMENT FOR METACARPAL NECK FRACTURES WITH VOLAR DISPLACEMENT

Yusuke Yuasa[1], Seietsu Senma[2], Yuichiro Narita[3], Tsuyoshi Shirahata[1], Hikaru Saito[2], Naohisa Miyakoshi[1]
[1]Akita University Graduate School of Medicine, Akita, Japan; [2]Nakadori General Hospital, Akita, Japan; [3]Minamiakita Orthopaedic Clinic, Akita, Japan

Background: Metacarpal fractures account for approximately 42% of all hand fractures, with neck fractures being the most common subtype. While surgical intervention is often required for rotational deformities, the indications for surgery concerning angular deformities remain controversial. This study aims to compare the outcomes of conservative and surgical treatment for metacarpal neck fractures with significant volar displacement and to evaluate the role of surgery in managing angular deformities.
Methods: We examined 33 cases (36 digits: 1 index finger, 1 middle finger, 4 ring fingers, and 30 little fingers) of metacarpal neck fractures with volar displacement of 30° or more, treated between 2013 and 2023. Patients were divided into a conservative treatment group (20 digits) and a surgical treatment group (16 digits). We compared age, initial volar displacement angle, follow-up period, bone union rate, final volar displacement angle, metacarpophalangeal (MP) joint range of motion, percentage total active motion (%TAM), grip strength ratio (affected side vs. unaffected side), presence of residual pain rate, and incidence of complications between the two groups.
Results: There were no significant differences in age or initial volar displacement angle between the two groups. However, the follow-up period was significantly longer in the surgical group (3.6 months in the conservative group vs. 6.2 months in the surgical group, $p = 0.0118$). The bone union rate was 100% in both groups. The final volar displacement angle was significantly smaller in the surgical group (30.4° in the conservative group vs. 15.0° in the surgical group, $p < 0.001$). MP joint extension was significantly greater in the surgical group (5.4° in the conservative group vs. 15.7° in the surgical group, $p = 0.00529$). There were no significant differences in MP joint flexion angle, % TAM, grip strength ratio, or residual pain rate, and no complications were observed in either group.
Discussion: Compensation for volar deformity is thought to occur through hyperextension at the MP joint. However, MP joint hyperextension may sometimes lead to pseudo-clawing. In our study, the MP joint extension angle was smaller in the conservative group than in the surgical group, suggesting limitations in compensatory hyperextension. Surgical reduction of volar displacement may enable the restoration of the native MP joint range of motion.

A-0101 MANAGING COMPLEX UPPER EXTREMITY CONDITIONS THROUGH COMPARATIVE TAPING - A NOVEL CLINICAL APPROACH

Saba Kamal
Hands-On-Care, San Jose, Ca, USA

Introduction: There are many tapes available in the market. Some can be used for lymphatic correction through “channeling”, while others provide fascial correction, “Holding” to align the tissue in the desired position, or Space correction (lifting) to create more space directly above the area of pain, inflammation swelling or edema or even ligamentous and

tendon correction through "pressure" or provide Mechanical Correction via proprioception.
Methods: We provide insights into accurate adjunct treatment to maintain the gains made in the clinic with manual therapy and exercises. We encourage out of the box thinking and use of various tapes and methods when treating the same injury. Tapes can be used for proprioception, pain management and treatment.
One technique may work well at the beginning of the rehab but as we progress, we may have to apply some other technique or tape just like how we change our rehab based on the presentation of symptoms.
Test and re-test is used to ensure efficacy of these tapes for a successful outcome
Topics and tapes covered are as follows
1) Lacertus syndrome – Leuko vs Kinesio - management
2) Carpal tunnel - Leuko and Kinesio proprioception to management
3) Dequervains – Leuko taping proprioception to management
4) Radial tunnel – Leuko vs Kinesio management
5) Scapho Lunate or Lunotriquetral Grade 1-2 instability – Dynamic taping
Results: Taping provides improved psychological, structural and neurosensory effect by providing treatment between treatments, making the patient become an active participant in their rehab, due to corrected mobility and reduced pain, thus resulting in improved clinical outcomes, faster return to active strengthening and ROM exercises
Conclusion: The structural application of tape provides mechanical support, which results in continuous uninterrupted stimulation, resulting in enhanced postures and protected ROM, thus protecting the healing tissues and stimulating structural adaptions and breaking the cycle of poor posture and abnormal mechanics.
The increase in conscious awareness plus perception of stability results in decrease in fear of activity or re-injury.
Bibliography:
- Cools et al, Man Ther 2002
- Host, Phys Ther 1995
- McConell, Jour. Sc. Med. Sport 2000
- Page et al ACSM Annual Meeting 1999
- Morrisey 2000;
- Alexander et al Man Ther 2003

A-0102 IS PRONATOR QUADRATUS REPAIR ESSENTIAL IN DISTAL RADIUS FRACTURE SURGERY? INSIGHTS FROM A FUNCTIONAL RECOVERY STUDY

Cheungsoo Ha[1,3], Chi-Hoon Oh[2], Segi Kim[1], Soo-Hong Han[1]
[1]CHA Bundang Medical Center, Seongnam, South Korea; [2]Korea University Ansan Hospital, Ansan, South Korea; [3]Armed Forces Daejeon Hospital, Daejeon, South Korea

Introduction: This study investigates the necessity of repairing the pronator quadratus (PQ) muscle in patients undergoing open reduction and internal fixation (ORIF) for distal radius fractures (DRF). The PQ repair is often performed to stabilize the distal radioulnar joint and potentially enhance forearm pronation. However, controversy remains regarding its essentiality for functional recovery, with some studies suggesting PQ repair may not significantly impact rotational power.
Materials and Methods: From January 2022 to January 2023, 51 patients with DRF received ORIF without PQ repair. A single expert surgeon performed all procedures using a 2.4mm Variable Angle LCP Distal Radius System (DePuy Synthes®). Pronation and supination strength were measured on both wrists (operated and contralateral) before hardware removal

using a wrist dynamometer. Additional parameters included DASH scores, range of motion, and incidence of complications
Results: The operated wrists showed decreased pronation and supination power compared to the contralateral side, yet maintained a similar pronation/supination power ratio. DASH scores indicated no significant functional deficits, and clinical outcomes were satisfactory, with no complications reported. These results suggest that the lack of PQ repair does not adversely affect long-term functional outcomes or pronation power.
Conclusion: Our findings indicate that omitting PQ repair during ORIF for distal radius fractures yields favorable functional outcomes, with reduced operation time and no increase in complications. This approach may simplify the surgical procedure while maintaining satisfactory clinical results, supporting that PQ repair may not be essential for effective rotational recovery.

A-0104 EFFECT OF SCAPHOID PROXIMAL POLE EXCISION ON WRIST STABILITY

Ronit Wollstein[1,2], Nicholas Parody[1], Paul Izard[1], Sallie Yassin[1], Steven Glickel[1]
[1]NYU Grossman School of Medicine, New York, NY, USA; [2]University of Alabama Heersink School of Medicine, Birmingham AL, USA

Introduction: Excision of the proximal pole of the scaphoid is rarely performed since it is known to cause wrist instability. Since the proximal fragment is often small and unstable, retention of the proximal pole can be challenging. Many procedures have been suggested to preserve the proximal pole including use of osteochondral grafts and prosthetic replacements. However, since the mechanical implications of a proximal pole loss are not well-known, it is possible that under certain circumstances, the proximal pole can be excised without causing instability, though maybe necessitating an accompanying fusion or another stabilizing procedure.
Aim: To use a validated finite element model (FEM)of normal type 1 and type 2 wrists to examine the effect of removal of the proximal pole of the scaphoid on the forces moving through the midcarpal joint.
Material and Methods: Fourteen wrist CT scans were converted to .stl files. Five Type-1, 9 Type-2. Using a previously established wrist FEM model, the proximal scaphoid was sequentially excised up to 50%. A 100N load was applied to the dorsal crests of the trapezoid and capitate (based on in-vivo data from push-ups). Trapezoid, trapezium, scaphoid, capitate, and hamate displacement was recorded in the x, y, and z directions. A paired-sample t-test was used. Percent change from intact was calculated for Type-1 and 2 wrists.
Results: Excision of the proximal pole of the scaphoid caused translation of the carpal bones regardless of wrist type $p<0.001$. Type 2 wrists reached a statistically significant change in displacement of the carpal bones after 15% excision, compared to 25% for type 1 wrists.
The direction of bony translation differed between type 1 and 2 wrists.
In general type 1 wrists seem to be less stable than type 2 wrists
Conclusions:

- This study supports the importance of the proximal pole of the scaphoid for wrist stability.
- The structure of the midcarpal joint affects the way forces are transferred through the wrist when the proximal pole is missing.
- This knowledge can be used in surgical planning in the face of a proximal pole fracture, nonunion, or complex wrist fracture dislocations.

A-0105 HOW AGGRESSIVELY SHOULD WE TREAT LOW-CALIBER GUNSHOT WOUNDS IN THE HAND?

Pearce Lane, Melissa Robinson, Ronit Wollstein
University of Alabama Heersink School of Medicine, Birmingham AL, USA

Introduction: The incidence of Low-caliber gunshot wounds (GSW) to the hand continues to increase. Most low-caliber GSW's are treated in the emergency department (ED) with washout, intravenous antibiotics and further treatment performed as outpatient. Treatment may be controversial for timing and extent of washout, debridement, and fixation.
Methods/Cases: We report on three cases where likely insufficient washout and debridement brought about an infected nonunion. Each patient underwent irrigation, stabilization, and received antibiotics, yet showed no evidence of interval healing at follow-up. One of the patients demonstrated evidence of infection only one week following the injury.
Results: Cultures were positive in all cases and a surgery for debridement, fixation as well as antibiotic treatment was necessary. Only one patient followed up as recommended by the treating surgeon, yet two of three of the patients demonstrated clinical improvement after surgical intervention.
Conclusions: Despite being low caliber, this type of GSW to the hand likely causes more damage than to a larger part of the upper or lower extremity given the proximity of vital anatomic structures in the hand. We suggest considering a more aggressive initial treatment, even if this is performed in the emergency room, especially for fracture patterns that could otherwise be treated non-operatively and in a particularly nonadherent population.

A-0106 PATIENT-REPORTED AND FUNCTIONAL OUTCOME MEASURES AFTER SURGICAL SALVAGE PROCEDURES FOR POSTTRAUMATIC RADIOCARPAL OSTEOARTHRITIS – A SYSTEMATIC REVIEW

Jane Gruisen[1], Philip Schormans[2], Ilona Punt[1], Alex Roth[1], Sander van Kuijk[1], Martijn Poeze[1], Pascal Hannemann[1]
[1]Maastricht University Medical Center, Maastricht, Netherlands; [2]Amphia Hospital, Breda, Netherlands

Background: Posttraumatic wrist osteoarthritis occurs secondary to bone fracture, ligament injury or joint dislocation. It is an irreversible and often progressive process which can cause pain and limit function. Current salvage procedures try to relieve the pain and restore function.
Objectives: The objective of this systematic review is to assess the patient-reported and functional outcomes of the most common surgical procedure in patients with posttraumatic wrist osteoarthritis. This overview can assist clinicians in selecting the most suitable treatment and managing patient expectations.
Method: A literature search was performed according to the PRISMA guidelines in Pubmed, Embase and Cochrane for articles published between 1990 and November 2022. Studies that assessed patient-reported outcomes, such as pain (VAS score) and Disability of Arm, Shoulder and Hand (DASH)–score, or functional outcomes, such as range of motion (ROM) and grip strength after a surgical salvage procedure with a minimal follow-up of 1 year in posttraumatic osteoarthritic wrist patients, were included. The surgical salvage procedures encompassed denervation, proximal row carpectomy, interposition- and total arthroplasty, and midcarpal-, radiocarpal- and total arthrodesis. The pre-and postoperative outcomes were pooled and presented per salvage procedure. A subanalysis was performed for patients with SNAC/SLAC II after proximal row carpectomy and midcarpal arthrodesis
Results: Data from 50 studies was included in the analyses. Pain score improved after all salvage procedures except denervation. DASH score improved after interposition-, total arthroplasty, proximal row carpectomy, and midcarpal arthrodesis. Flexion-extension ROM decreased after denervation and radiocarpal arthrodesis, did not show changes after proximal row carpectomy and increased after all other procedures. Radial and ulnar deviation ROM decreased

after denervation, increased after total arthroplasty and midcarpal arthrodesis and did not show changes after all other procedures. Grip strength improved after interposition arthroplasty, midcarpal- and radiocarpal arthrodesis. Patient-reported SNAC/SLAC II patients improved after proximal row carpectomy and midcarpal arthrodesis. ROM improved after proximal row carpectomy while it did not change after midcarpal arthrodesis.
Conclusion: Based on the results from this review the indication for denervation in posttraumatic osteoarthritic wrist patients is not supported. Proximal row carpectomy might be favourable over midcarpal arthrodesis in patients with SNAC/SLAC II based solely on improved flexion-extension ROM after proximal row carpectomy. In osteoarthritic wrist patients due to distal radius fracture, total wrist arthroplasty might be preferred to radiocarpal arthrodesis based on ROM. More uniform outcome measurements would improve the insight into the effect of surgical salvage procedures in the posttraumatic osteoarthritic wrist.

A-0107 ASSOCIATION BETWEEN KIENBOCK'S DISEASE AND MIDCARPAL JOINT STRUCTURE-A PILOT STUDY

Tal Kalimian, Ronit Wollstein
University of Alabama Heersink School of Medicine, Birmingham AL, USA

Background: The etiology of Kienbock's disease (avascular necrosis of the lunate), remains unknown, likely remaining multifactorial and involving both vascular insufficiency and mechanical factors. Recent research suggests that wrist structure affects the mechanics of the joint and that type 2 wrists transfer forces more radially towards the scaphoid and scapholunate ligament, potentially offering protection against lunate overload, whereas type I wrists deliver forces more ulnarly which may increase stress on the lunate and predispose it to avascular necrosis.
Objective: Since anatomical variations in wrist structure significantly influence how forces are distributed across the wrist joint, we examined the relationship between Kienbock's disease and wrist structure. Specifically, we hypothesized that there is an association between midcarpal joint structure and Kienbock's disease.
Methods: A retrospective review of 50 wrist radiographs diagnosed with Kienbock's disease was conducted. In all cases Kienbock's disease was confirmed by MRI. Exclusion criteria included individuals under 18 and those with confounding pathologies. Key parameters assessed included ulnar variance, radial tilt, lunate morphology, and the presence of osteoarthritis.
Results: Thirty-four radiographs and MRIs confirmed with Kienbock's disease were included in the pilot study. Average age was 45.3 years (SD=14.7). There were 76% female, 26 wrists (76%) were classified as type 1 and 8 (23%) type 2.
Conclusion:

- In our population type 1 wrists were associated with Kienbock's disease.
- Many studies support more common type 2 wrists in the general population, though this remains unknown. Furthermore, in our population females were more prevalent than males with Kienbock's disease.
- Therefore, further study is needed to compare our results with the general wrist-pathology population and with other studies, to better elucidate the association between midcarpal joint type and the occurrence of Kienbock's disease.

A-0108 IN VITRO KINEMATIC ANALYSIS OF A NEW PATIENT-MATCHED POLYCARBONATE URETHANE RADIOCARPAL INTERPOSITION ARTHROPLASTY

Jane Gruisen[1], Philip Schormans[2], Alex Roth[1], Ilona Punt[1], Geert Streekstra[3], Johannes Dobbe[3], Martijn Poeze[1], Pascal Hannemann[1]

[1]Maastricht University Medical Center, Maastricht, Netherlands; [2]Amphia Hospital, Breda, Netherlands; [3]Amsterdam UMC, Amsterdam, Netherlands

Background: Current surgical salvage procedures for posttraumatic osteoarthritic wrist patients especially arthroplasties try to reduce pain and improve function such as range of motion (ROM). The surgical procedures for these salvage procedures are irreversible due to the excision of bone or tissue and/or fusion of radiocarpal bones. To offer both a reversible and motion-preserving solution radiocarpal interposition arthroplasty is a possible option. An important complication after current interposition arthroplasties is dislocation. To address this issue, our research group has designed an enhanced patient-specific polycarbonate urethane (PCU) implant.

Objectives: This study aims to evaluate the effect of the PCU radiocarpal interposition arthroplasty on wrist ROM and carpal kinematics. Additionally, the displacement of the implant is assessed using three-dimensional (3D) imaging during functional ROM.

Method: The passive wrist ROM was tested in a wrist motion simulator in three cadaveric arms before and after PCU radiocarpal interposition arthroplasty implantation with a moment of 1Nm. Carpal bone and PCU radiocarpal interposition implant translations and rotations were assessed by 3D fluoroscopy scans during flexion-extension (F/E = 60°/60°) at 15° steps. The carpal kinematics of the native and implant conditions were correlated with a linear mixed model analysis

Results: Except for a reduction of 10.3° in extension, no clinically relevant differences were found for the mean wrist ROM between native and implant conditions. The differences in carpal rotations and translations over the F/E curve were smaller than 2.5° and 2.2 mm and were therefore considered not clinically relevant. The maximal displacement of the PCU radiocarpal interposition implant was 6.3° and 1.1 mm during the F/E curve.

Conclusion: The PCU radiocarpal interposition arthroplasty may provide a promising option for posttraumatic osteoarthritic wrist patients since wrist mobility is maintained. Furthermore, the procedure is minimally invasive and non-excisional. Thus, the procedure is reversible leaving the option for all other surgical salvage procedures. Further clinical trials should evaluate the feasibility, safety and performance of this procedure.

A-0109 TREATMENT OF SYMPTOMATIC EXTRA-ARTICULAR MALUNIONS OF THE DISTAL RADIUS. A SURVEY AMONG EUROPEAN SURGEONS

Dominique Disseldorp[1], Niels Schep[2], Marjolein Mulders[3], Martijn Poeze[1], Pascal Hannemann[1]

[1]Maastricht University Medical Center, Maastricht, Netherlands; [2]Maasstad Hospital, Rotterdam, Netherlands; [3]OLVG Hospital, Amsterdam, Netherlands

Purpose: The purpose of this study is to gain more insight into potential controversial aspects associated with the surgical treatment of extra-articular malunions of the distal radius, leading to an initial step toward establishing guidelines.

Methods: We conducted a survey among surgeons experienced in performing corrective osteotomies of the distal radius. The collected data included general information about the respondents, (contra-)indications for surgical treatment, preoperative planning and technical aspects of the surgical procedures. We performed a subgroup analysis based on surgical experience (operating on ≤ 5 malunions/year and > 5 malunions/year).

Results: There was a high level of agreement on performing corrective osteotomy based on clinical symptoms and

radiographic abnormalities. However, there was no consensus on which specific radiographic abnormalities should be corrected. Moderate consensus was found on the necessity of obtaining an X-ray of the contralateral wrist and a CT scan of the affected wrist for preoperative planning. Most surgeons prefer using a corticocancellous bone graft from the iliac crest to fill the osteotomy defect. There was no consensus on the duration of postoperative cast immobilization. In our subgroup analysis, we found moderate consensus among the more experienced surgeons that timing was not important for planning of the surgery. Furthermore, the experienced surgeons were more likely to obtain a CT scan of the contralateral side as a template and to use synthetic bone model as replica of the patient's deformity as part of preoperative planning. Conclusion: This study gives more insight into the treatment of malunited extra-articular distal radius fractures, but some aspects remain the subject of debate. Future research on these aspects is necessary to optimize the operative treatment of malunited distal radius fractures.

A-0110 DECISION MAKING THROUGH CLINICAL REASONING IN COMPLEX CASES – CASES STUDIES DEMONSTRATING PRACTICAL MANAGEMENT

Saba Kamal
Hands-On-Care, San Jose, Ca, USA

Introduction: We as therapists use the process of intentional higher level of thinking to define a patient's problems, examine the evidenced based practice and make choices in the delivery of care. Critical thinking is extremely important when dealing with complex cases as it requires the clinician to think creatively, use reflection, and engage in analytical thinking. It requires the therapist to identify the clients' problems and then implement interventions to promote effective care outcomes.

Method: Case presentations address different issues at various stages of pathology/injury to the upper extremity, rooted in the concepts of anatomy, pathophysiology and biomechanics. Treatment interventions are formulated based on the latest evidence-based research and real-world clinics practical applications.

The evaluation process is broken down into various components of the assessment of a complex case. We formulate a hierarchical treatment plan contingent on patient's clinical presentation and assessment, which includes customized exercises based on knowledge of applied physics and designing appropriate splinting regimen during varied stages of injury based on tissue assessment and impairment.

By dividing the evaluative process into sub-tasks, we demonstrate how we can establish a more effective treatment plan that follows a hierarchical process of healing instead of following protocols.

1) Stiff Arm (shoulder, elbow, wrist and Hand S/P supracondylar fracture and referred 3 months out
2) Stiff hand s/p Distal radius / ulnar styloid fracture with ORIF referred 2 weeks out

Results: See how the decision making via clinical reasoning and critical thinking changes when referred early vs late and how it can be managed effectively.

Conclusion: Clinical implications of tissue healing whether tendon, bone, ligament, skin at various stages requires a level of decision making to provide appropriate treatment from immobilization to early mobilization, and modifying the post-op rehab to focus on elements of loading based on the healing principles of these various tissues.

Bibliography

- Boyer 2005; Gelberman 1983
- Bittencourt & Crossetti, 2012
- Higgs et al 2008
- Victor-Chmil, 2013

A-0112 SCREW FIXATION FOR BONY MALLET FINGER WITH DOUBLE EXTENSION BLOCK PINNING FOR INTRAOPERATIVE REDUCTION

Yusuke Higashiyama[1,2], Kazutoshi Kubo[1,2], Keikichi Kawasaki[1,3], Toshiyuki Shirahata[1,2], Yoshifumi Kudo[1]
[1]Showa University School of Medicine, Department of Orthopaedic Surgery, Tokyo, Japan; [2]Showa University Koto Toyosu Hospital, Tokyo, Japan; [3]Showa University Northern Yokohama Hospital, Yokohama, Japan

Introduction: Several treatment methods are reported for bony mallet finger such as percutaneous wire fixation, and open reduction using plate, pull out wiring and screw.
Aim: To demonstrate our modified surgical technique (screw fixation with double extension block pinning for intraoperative reduction) for bony mallet finger.
Materials and Methods: Seven patients were treated (1 thumb, 2 index, 3 long and 1 ring fingers) with our method between October 2021 and June 2024.Exclusion criteria included mallet finger fracture involving less than one-third of the articular surface, comminuted fracture in CT scan, and the fracture in little finger. We treated seven patients with a mean age of 35.6 years (13 to 54). The mean joint surface involvement was 50.0% (47% to 55%), The mean time from injury to operation was 9.9 days (4 to 17). The procedure was performed under digital block anesthesia.
A center line was drawn along the axis of distal and middle phalanx. Two extension-block pins (0.8mm K wire) were inserted from radial and ulnar side of the line. Closed reduction was achieved by extending distal phalangeal joint. Third K wire was used from dorsal side between the extension block pins for drilling fragment and indicator of screw direction. Small incision was made before removing the drilling wire and 1.2mm screw (Medartis, Swiss) was inserted (2.0mm screw was applied for thumb). DIP joint was immobilized with splint for a week. After the removal of splint, active motion of DIP were started in all patients. Two patients underwent implant removal 8 months after primary operation at their request.
Results: Bone union were achieved in all case in three months. No complications were observed such as malunion, osteoarthritis, infection, nail deformity. The mean active flexion of the DIP was 80.7° (60° to 90°) and extension was -4.3° (-20° to 0°). According to the Crawford's classification (Table I), the outcome was excellent in 4 (57.1%), good in 2, (28.6%), and fair in 1 (14.3%) patients.
Conclusions: The study suggests that double extension block technique, which allows stable intraoperative reduction and facilitate the screw insertion, is an effective surgical procedure and obtain satisfactory clinical outcomes for bony mallet finger.

A-0114 LONG-TERM RESULTS OF SELECTIVE PERIPHERAL NEURECTOMY FOR THE TREATMENT OF PATHOLOGICAL SHOULDER ROTATION IN PATIENTS WITH DYSKINETIC CEREBRAL PALSY

Izabela Blaszczyk[1], Mohammad Asif Aslam[2], Per Jenmalm[1], Staffan Svenlin[1]
[1]Department of Diagnostic and Intervention, Hand and Plastic Surgery, Umeå University, Umeå, Sweden; [2]Department of Surgical Sciences, Orthopaedics and Hand Surgery, Uppsala University, Sweden

The function of the upper limbs in patients with dyskinetic cerebral palsy (DCP) is often impaired, characterized by involuntary and uncontrolled movements as well as persistent primitive reflexes. Various treatment options, including oral medications, intrathecal baclofen, deep brain stimulation, and intramuscular injections of botulinum toxin A (BoNT-A), have been utilized to manage these movements. Since 2001, we have been administering BoNT-A to address involuntary and uncontrolled shoulder movements in patients with DCP.
In some cases, we opted to replace BoNT-A injections with selective peripheral neurectomy of the infraspinatus branches of

the suprascapular nerve, and in one case, the upper and lower subscapular nerves. The first neurectomy was performed in 2009. We previously described our surgical technique and presented early clinical results from six patients (seven shoulders) (Blaszczyk I, Granström AC, Wiberg M. "Denervation of the infraspinatus and release of the posterior deltoid muscles in the management of dyskinetic external shoulder rotation in cerebral palsy." J Neurosurg Pediatr. 2015 Apr;15(4):438-44. doi: 10.3171/2014.9.PEDS14223. Epub 2015 Jan 16. PMID: 25580511).
We have now applied our method in a total of 13 patients, with the procedure performed bilaterally in three cases (resulting in a total of 16 shoulders). To evaluate the outcomes of the neurectomies, we utilized postoperative patient satisfaction questionnaires and pre- and post-surgical video recordings.
Results: We observed significant relief of involuntary and uncontrolled movements in 13 out of 16 shoulders. However, no improvement was noted in three shoulders from three different patients. We believe that our approach to selective neurectomy is unique and demonstrates promising long-term results for treating this disabling condition in patients.
Key words: dyskinetic cerebral palsy, upper limb, pathological shoulder rotation, selective peripheral neurectomy.

A-0115 IS THERE STILL A PLACE IN THE 21ST CENTURY FOR SPANNING PLATES IN THE SURGICAL TREATMENT OF COMPLEX DISTAL RADIUS TRAUMA?

Lucian Stratan
Universitary Hospital of Martinique, Fort-De-France, Martinique, France

Introduction: The use of Spanning Plates for highly comminuted fractures of the distal radius emerged in the 1990s in Seattle, USA, with excellent results. The advent of locked volar plates in the early 2000s marginalized the use of any other wrist fixation method, even though, in some complex fractures, alternative solutions are needed that are better suited, such as Fragment Specific Fixation or the Spanning Plate.
Materials and Methods: In Europe, the use of this technique remains very marginal. Our department introduced this practice in France in 2021, and we have treated 20 patients over three years. The primary indication remains highly comminuted, intra-articular fractures of the distal radius, but also radio-carpal fracture-dislocations. Our patient population ranges from 30 to 86 years old; however, Spanning Plate indications primarily concern older patients with severe osteoporosis.
Results and discussions: Our presentation aims to highlight the results of our experience with the use of Spanning Plates in complex distal radius trauma and to demonstrate that complete radio-carpal immobilization for two months does not cause any major postoperative stiffness, and patients can regain satisfactory function and mobility with this technique
Conclusions: Our conclusion is that Spanning- or Bridge-Plates remain a far more satisfactory alternative than external fixators in highly comminuted (or fracture-dislocation) cases of distal radius fractures, provided this technique is reserved for closed trauma cases.

A-0116 PRP- VERSUS PLACEBO INJECTION FOR PAINFUL THUMB BASE OSTEOARTHRITIS

Maria Wilcke, Kajsa Evans, Johanna von Kieseritzky, Julia Stenseth
Department of Hand Surgery, Södersjukhuset, Stockholm, Sweden

Background: Thumb base osteoarthritis (OA) is the second most common type of OA in the hand. The impact on everyday life may be severe with pain and reduced function both at work and in spare time. First line treatment options include intra-articular injection of steroids. The effect of steroids varies considerably, the scientific evidence for its use is poor,

and a potentially negative effect on the cartilage has been suggested. An alternative is platelet rich plasma (PRP). PRP has been described as a cocktail of growth factors and anti-inflammatory mediators that has shown positive effect on pain and function in knee osteoarthritis. For thumb base osteoarthritis, current evidence is inconclusive. A few small studies exist on the effect of PRP compared to steroid injection, hyaluronic acid, and placebo. Previous publications are retrospective or case reports with low level of evidence.
Objectives: This study aimed to compare the short-term effect of intra-articular injection of PRP versus placebo in patients with painful thumb base osteoarthritis.
Methods: In a prospective double-blind randomized controlled trial, 90 patients with painful thumb base OA were randomized to a single intra-articular injection of either PRP or placebo (NaCl) between 2020 and 2023. The study was registered in clinicaltrials.gov (MCT04218591). Arthrex® ACP system was used. The primary outcome was change in pain on load (Numeric Rating Scale (NRS) 0-100) between baseline and 6 months. Secondary outcomes were pain on load after 3 months, and pain at rest, Patient Rated Wrist and Hand Evaluation (PRWHE), Disability of the Arm, Hand and Shoulder score (DASH), range of motion, key pinch, and three-finger pinch strength after 3 and 6 months.
Results: The groups were similar regarding sex and age distribution. Data will be presented that suggests that there is no relevant difference on primary outcome (pain on load) between PRP and placebo. Nor are there any significant differences in secondary outcomes between the groups. Exact data will be presented at the congress.
Conclusion: There is no difference in effect on pain and function in the short-term between a single injection of PRP and placebo for painful thumb base osteoarthritis.

A-0117 HIGH-PRESSURE INJECTION HAND INJURY - A RARE, SOMETIMES UNDERESTIMATED, BUT REAL HAND EMERGENCY

Mihaela Pertea[1,2], Stefana Luca[1,2], Malek Benamor[2], Alexandru Amarandei[2], Dan Cristian Moraru[1,2]
[1]Grigore T Popa University of Medicine and Pharmacy Iasi, Romania; [2]Department of Plastic Surgery and Reconstructive Microsurgery, Sf Spiridon Emergency County Hospital Iasi, Romania

The aim is to bring attention to a rare type of trauma that appears to be minor with negligible signs and symptoms within the first hours after the accident, but in reality, produces significant tissue destruction with severe consequences. Recognizing this type of trauma by medical personnel, understanding the mechanisms involved, and knowing the etiological and prognostic factors can lead to early treatment initiation and avoid severe, mutilating sequelaes.
Methods: We studied a cohort of 16 patients diagnosed with high-pressure injection injuries, The injected substances identified in the study group included water, air, paint, paint mixed with thinner, petroleum jelly, and lime (washable paint containing calcium oxide). We examined studied The patients' epidemiological data, the time from accident to diagnosis, reasons for delayed diagnosis, treatments used, and outcomes.
Results: In all cases, the injuries occurred at the workplace due to negligence. Among the etiological factors, oil-based paint was implicated in 31.25% of cases. The most frequently affected anatomical region was the volar surface of the distal phalanx of the left nondominant hand index finger. Delayed presentation to medical care and diagnosis resulted in compartment syndrome in one cases, with one requiring amputation of the second phalanx. Postoperative physical therapy played a crucial role in improving functional outcomes
Conclusions: High-pressure injection trauma is rare, apparently "benign", but with serious evolution and possible serious, disabling functional and aesthetic sequelaes. This type of pathology must be known, of course, by hand surgeons/plastic surgeons, but also by emergency doctors and family doctors, categories of specialists who come into contact with patients at the site of the trauma or immediately post-traumatic and to whom the patients address frequently.

A-0119 MEDICAL LEECH THERAPY - STILL CURRENTLY IN THE TREATMENT OF VENOUS CONGESTION AFTER REPLANTATIONS?

Mihaela Pertea[1,2], Stefana Luca[1,2], Malek Benamor[2], Dan Cristian Moraru[1,2]
[1]Grigore T Popa University of Medicine and Pharmacy Iasi, Romania; [2]Department of Plastic Surgery and Reconstructive Microsurgery, Sf Spiridon Emergency County Hospital Iasi, Romania

Background: In "contemporary" plastic surgery, in 1980, Guy Foucher used leeches to relieve venous congestion in finger replantations and in 2005, Frodel used them following the amputations of the nasal lobe,ear, lip and scalp. Soon after leeches began to be used in medicine, the first studies on leeching complications appeared; thus, in 1983, Aeromonas hydrophila and Aeromonas veronii infections are mentioned after leech therapy and Whitlock et al. showed the increased risk of infection with these bacteria in the poorly vacuolated tissues. In 2004, medicinal leeches were approved by the U.S. FDA as a medical device.
Materials and methods: The study included a group of 21 cases with complete finger amputations and 4 cases of ,,ring finger,, avulsion. Inlusion criteria was venous congestion after microsurgical replantation with or no venous anastomosis. While establishing the indication for the use of medical leech therapy (MLT), all patients were informed and counseled psychologically regarding this treatment. Medicinal leeches were placed after the first signs of venous congestion were present. Leeches were applied at the level of the "skin window" and was continued for 5-7 days, when the signs of venous congestion disappeared. Antibiotic therapy was administered, as in all cases, for the prophylaxis of Aeromonas hydrophila infections.
Results: In all cases the venous congestion was treated. The number of used leeches was two to four per day, and the length of treatment. In none of the reported cases postoperative or leeching-related bleeding did not occur that required blood transfusions. No infections were recorded
Conclusions: Hirudotherapy cannot be defined as an alternative but rather complementary method. Its main advantages are: low-cost, relative ease of use, and high effectiveness. Patient consent and collaboration, as well as psychological preparation before using MLT are essential.

A-0120 NETWORK META-ANALYSIS OF PROPHYLACTIC ANTIBIOTICS IN HAND TRAUMA SURGERY

Suraya Yusuf[1], Chen Zhang[1], Moe Takenoshita[1], Ryckie George Wadę[2], Justin Conrad Rosen Wormald[1,3]
[1]Oxford University Hospitals, UK; [2]Leeds Institute for Medical Research, UK; [3]Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, UK

Aims: This study aims to evaluate the efficacy of prophylactic antibiotics in preventing surgical site infections (SSIs) in hand trauma surgery through a network meta-analysis (NMA). Despite their widespread use, the effectiveness of prophylactic antibiotics in emergency settings remains unclear, necessitating a comprehensive assessment of current literature. Unlike previous meta-analyses, this NMA provides a definitive quantitative summary of all currently available data across multiple antibiotic classes, allowing indirect comparisons and providing a more robust and comprehensive understanding of relative antibiotic effectiveness.
Methods: A thorough literature search was performed across EMBASE, MEDLINE, CINAHL, and CENTRAL, supplemented by manual searches of clinical trial registries. Prospective comparative studies examining the use of antibiotics versus placebo or no antibiotics in patients undergoing surgery for hand and wrist trauma were included. Data on SSI rates were extracted and analysed using network meta-analysis with frequentist random-effects models.

Results: Of 4,499 articles screened, 14 randomised controlled trials (RCTs) and 2 non-randomised studies (NRSs) involving 3,977 participants were included. The overall SSI rate was estimated at 4.04%. Our NMA indicated that prophylactic antibiotics did not significantly reduce SSI rates compared to placebo, with penicillin and macrolide classes showing relative risks (RR) of 0.70 (95% CI: 0.42-1.15) and 0.69 (95% CI: 0.07-6.53), respectively. Subgroup analyses revealed no significant differences based on injury type, location of surgery or timing of antibiotic administration

Conclusions: This analysis demonstrates insufficient evidence to support routine prophylactic antibiotic use in hand trauma surgery, in contrast to current clinical practice. Existing research includes a predominance of studies with moderate to high risk of bias, variability in SSI definitions, and inadequate follow-up periods. Consequently, future high-quality RCTs are warranted to refine these recommendations, address the significant gaps in the current literature, and improve our understanding of optimal antibiotic strategies in hand trauma surgery.

A-0121 PAEDIATRIC CASE OF INVASIVE GROUP A STREPTOCOCCAL MYOSITIS

Suraya Yusuf[1], Justin Conrad Rosen Wormald[1,2], Michael Carter[1], Jenny Woodruff[1], Claire Sethu[1]
[1]Oxford University Hospitals, UK; [2]Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, UK

Background: Necrotising myositis (NM) is a rare but life-threatening infection, typically caused by invasive Group A Streptococcal (iGAS) bacteria. The condition progresses rapidly and requires prompt diagnosis and aggressive surgical intervention to improve survival. Mortality rates of 36% have been reported despite best treatment, and delays in surgery increase this. Unfortunately, early symptoms may be non-specific, often delaying diagnosis.

Case Presentation: We report the case of a previously healthy five-year-old girl who presented with non-specific malaise and arm pain, initially attributed to viral illness. On repeat presentation to hospital, her condition deteriorated within hours, she developed severe pain and swelling in her left arm, accompanied by hypotension refractory to fluid resuscitation. Despite the absence of cutaneous signs of necrotising soft tissue infections, rapid deterioration, markedly raised inflammatory markers and elevated creatinine kinase levels raised suspicion of necrotising myositis. Emergency surgical exploration confirmed NM with significant muscle necrosis, necessitating a trans-glenoid amputation for source control.

Management and Outcome: Postoperatively, the patient required multiorgan support on intensive care. Cultures confirmed Streptococcus pyogenes guiding targeted antibiotic therapy, alongside the use of intravenous immunoglobulin. Her recovery was complicated by ventilator-associated pneumonia and Clostridioides difficile infection, yet she ultimately made a full neurological recovery. She underwent reconstruction of the shoulder defect with a pedicled Latissimus dorsi flap, biodegradable temporising matrix and split thickness skin grafts.

Conclusion: This case highlights the diagnostic challenges of NM, particularly due to absence of cutaneous signs which delayed diagnosis. Clinicians must maintain a high index of suspicion for NM in patients with disproportionate pain and rapid clinical decline. While clinical scoring tools such as the LRINEC score exist, they have been shown to be of limited utility and are not validated for use in paediatric patients. Although intravenous immunoglobulin was administered in this case, its efficacy in iGAS infections remains controversial. Early recognition, broad-spectrum antibiotics, and aggressive surgical debridement remain critical to survival in NM cases, as timely intervention can be lifesaving.

A-0122 ANALYZING TREATMENT OUTCOMES IN SCAPHOID NONUNION: A COMPARATIVE STUDY OF HUMPBACK DEFORMITY VERSUS DORSAL TRANSLATION

Chi-Hoon Oh[1], Cheungsoo Ha[2], Soo-Hong Han[2]

[1]Department of Orthopedic Surgery, Korea University Medicine Ansan Hospital, Gyeonggido, Republic of Korea; [2]Department of Orthopedic Surgery, CHA Bundang Medical Center, CHA University School of Medicine, Gyeonggi-do, Republic of Korea

Background: Scaphoid nonunion has the potential to advance into scaphoid nonunion advanced collapse (SNAC), causing alterations in the biomechanics of the carpal joint, arthritis in the proximal joint region, and deformities arising from malunion. Consequently, addressing nonunion involves the necessity for bone grafting to manage the nonunion fracture gap, with treatment predominantly employing non-vascularized bone grafting and screw fixation in recent studies. The position of the fracture about the apex of the dorsal scaphoid ridge serves as a dependable indicator for assessing the progression of scaphoid nonunion deformity. Due to the dorsal intercarpal ligament (DIC) attaches to the apex of the scaphoid dorsal ridge, after fracture distal then apex, causing volar flexion of the distal pole fragment leading to humpback deformity. More proximal fracture lines than dorsal apex exhibit relative stability with mild dorsal translation due to connection with lunate and ligament. However, the anatomical similarity to proximal pole fractures raises concerns about reduced blood flow. For this reason, this study aims to compare and analyze the treatment results and characteristics accord to the type of deformity in groups that performed the same cancellation auto bone graft and screw fixation.

Materials and methods: A retrospective analysis was conducted on patients with Humpback-like deformity and and Dorsal translation deformity among those with scaphoid nonunion who underwent surgery at a single institution from 2001 to 2022. Seventy patients were included in the study, and the clinical assessment encompassed the Modified Mayo Wrist Score (MMWS), Disabilities of Arm, Shoulder and Hand (DASH) score, range of motion in the elbow joint, and surgery-related complications. Radiological evaluations involved examining bone union status at the final follow-up, as well as parameters such as the lateral intrascaphoid angle (LISA)

Results: Among the patients included in the study, there were 65 males and 5 females, with an average age of 36.8 years (ranging from 17 to 69 years). The analysis involved 33 cases of Humpback-like deformity and 37 cases of Dorsal translation deformity. In cases of Humpback-like deformity, 7 exhibited a notable humpback deformity with a lateral intrascaphoid angle (LISA) greater than 40 degrees. Bone union occurred in 32 cases, with an average union time of 4.5 months. Three cases resulted in nonunion, with 2 being asymptomatic, and 1 requiring additional quadruple joint fusion surgery due to pain and swelling. For cases of Dorsal translation deformity, 31 exhibited bone union, and the average union time was 5.8 months. Eight cases resulted in nonunion, with 7 being asymptomatic, and 1 causing pain, leading to an additional procedure involving the 1,2-intercompartment supraretinacular artery (1,2-ICSRA).

Conclusion: In the analysis of this study, bone union was successfully attained in the majority of cases presenting both humpback-like deformity and dorsal translation deformity, with few complications observed. Nevertheless, in instances of dorsal translation deformity, the duration required for bone union was comparatively longer than that for humpback-like deformity. This discrepancy may be attributed to the fracture line being situated more proximally, reduced blood flow in that region.

A-0123 PRIMARY NERVE EXPLORATION IS REQUIRED IN MORE THAN 10 PERCENT OF COMPLETE MOTOR NERVE PARALYSIS CASES ASSOCIATED WITH GARTLAND TYPE III PEDIATRIC SUPRACONDYLAR HUMERUS FRACTURES: A MULTICENTER RETROSPECTIVE STUDY

Katsuhiro Tokutake[1], Rina Ito[2], Michiro Yamamoto[1], Nagoya Hand Group[1]
[1]Nagoya University Hospital, Nagoya, Japan; [2]Shinshiro Municipal Hospital, Shinshiro, Japan

Aims: This study aims to determine the prevalence, prognosis, and outcome of complete motor paralysis associated with Gartland type III pediatric supracondylar humerus fractures (SCHF) and identify when primary nerve exploration is indicated.
Methods: In this multicenter retrospective study, we investigated complete motor paralysis associated with Gartland type III pediatric SCHF. Iatrogenic paralysis was excluded. Radiographs were used to determine a fascial penetration sign. Findings from nerve explorations were recorded. Notable cases were defined as those with the following nerve conditions: (1) complete or partial laceration, (2) tethering/entrapment, (3) formation of a neuroma, or (4) entrapment at the fracture site or callus. The frequency with which ultrasound was used was documented and its findings were examined
Results: Among 691 patients with Gartland type III SCHFs, 45 (7%) had complete motor paralysis. Of these, 20 (20/45, 44%) were managed without primary nerve exploration. Eighteen spontaneously recovered and two required neurorrhaphy and nerve grafting during a secondary exploration. Of the other 25 (25/45, 56%) who underwent primary nerve exploration, one had a complete radial nerve laceration and five had tethered/entrapped nerves. The fascial penetration sign was positive in each of the eight notable cases (8/45, 18%), a rate that was significantly higher than in the others (19/37; $p=0.014$, sensitivity 100%, specificity 49%). Ultrasound was used preoperatively in 14 cases to investigate the condition of the nerve, possible contact with the proximal fragment, and its changes after traction.
Conclusion: For Gartland type III pediatric SCHF patients with complete motor paralysis, we estimate that more than 10% require primary nerve exploration due to tethered/entrapped or lacerated nerves. A positive fascial penetration sign on radiography indicated that primary nerve exploration should be considered. Preoperative ultrasound during general anesthesia to visualize the nerve condition can be key to determining when to perform primary nerve exploration.

A-0124 RETURN TO DRIVING AFTER CARPAL TUNNEL SYNDROME SURGERY

Nicolas Bigorre, Ewen Lataste, Alexandre Petit
Centre de la Main Angers, France

Introduction: Carpal tunnel syndrome (CTS) surgery is one of the most frequent surgical procedures performed in hand surgery and has long been shown to be effective. However, there are still no recommendations concerning the return to driving after the operation.
Hypothesis: The aim of this study was to determine the average time to return to driving after CTS surgery, and to identify the factors influencing this time.
Material and Methods: Patients who underwent surgery for CTS between 16 November 2022 and 14 November 2023, and who agreed to complete a simplified questionnaire on return to driving at the follow-up visit were included retrospectively and monocentrically. Demographic characteristics, pre- and post-operative parameters and results of additional examinations were analysed.
Results: One hundred and seven patients were included in this study. The mean time to return to driving was 16 days. This time was significantly longer in female patients ($p=0.035$), in patients who had had their medical discharge postponed ($p<0.01$), and in those with a perception of work distress ($p<0.01$). Patients who were not working at the time of the

study returned to driving sooner (p=0.018), as did those with a higher nerve conduction velocity on the preoperative electroneuromyogram (p=0.022).
Discussion: Sex, professional activity, perception of difficulty at work and preoperative nerve conduction velocity are factors influencing the time taken to resume driving.

A-0125 DIAGNOSIS OF TRANSTHYRETIN AMYLOIDOSIS DURING CARPAL TUNNEL SURGERY: CHOICE BETWEEN TENOSYNOVIAL TISSUE AND TRANSVERSE LIGAMENT FOR BIOPSY

Nicolas Bigorre[1], Julien Jeanneteau[2], Maud Brousseau[3], Alexandre Petit[1]
[1]Centre de la Main Angers, France; [2]Institut du cœur – Clinique Saint Joseph Angers, France; [3]Institut d'histopathologie IHP – Angers France

Early detection of transthyretin amyloidosis significantly improves the efficacy of treatment. Carpal tunnel syndrome is recognized as an early extracardiac manifestation of transthyretin amyloidosis, often preceding cardiac involvement by several years. The ideal biopsy type for detecting transthyretin amyloidosis during carpal tunnel surgery remains unclear. This study aims to compare the diagnostic value of transverse ligament (LT) and tenosynovial biopsies (TS) in detecting transthyretin amyloidosis during carpal tunnel release surgery.
We conducted a prospective, single-center study involving 43 patients, aged 60 to 80, who underwent carpal tunnel surgery between October 2022 and June 2023. Both LT and TS biopsies were obtained during surgery, and the tissue samples were analysed using Congo red staining and immunohistochemistry. Biopsies were considered positive if amyloid deposits were detected in either sample. The study examined potential risk factors for transthyretin amyloidosis and compared the sensitivity of TL and TS biopsies.
Eighteen patients (41.3%) had positive biopsies, with one patient exhibiting cardiac signs and receiving etiological treatment. TL biopsies were positive in 18 cases (41.3%), while TS biopsies were positive in 6 cases (13.9%). When TL biopsies were positive, TS biopsies were also positive in 100% of cases, indicating a sensitivity of 30% for TL biopsies. No significant correlations were found between TL biopsy positivity and other risk factors, such as age, sex, bilateral CTS, or history of musculoskeletal surgery.
Our findings suggest that TS biopsy offers a higher sensitivity for detecting ATTR compared to TL biopsy. The addition of TL biopsy did not provide further diagnostic information. These results support the use of TS biopsy as the primary method for screening ATTR during CTS surgery. Larger studies are needed to confirm these findings and establish standardized biopsy protocols.

A-0126 METAL HYPERSENSITIVITY IN TRAPEZIOMETACARPAL ARTHROPLASTY. A SYSTEMATIC EVOLUTION SCENARIO

Nicolas Bigorre, Nathan Milot, Jérome Jeudy, Alexandre Petit
Centre de la Main, Angers, France

Metal hypersensibility remains a rare and often underestimated complication, as shown by the small number of studies published, particularly concerning the upper limbs, and the hand. However, the increase in the number of trapeziometacarpal arthroplasties implanted each year underlines the importance of a better understanding of this problem.
We performed a study based on data from the revision of trapeziometacarpal prostheses to assess the incidence of this complication and to define a sequence of radiological changes to detect a possible metal hypersensitivity.

This single-centre retrospective study included a series of 37 patients operated on between January 2014 and November 2023 for a revision trapeziometacarpal prosthesis. Of these, 18 patients (47.4%) had no clearly identified cause of failure. For these 18 patients, we analysed the clinical data and the X-rays made at the postoperative visits. Of the 18 revision arthroplasties, 10 patients had no symptoms or radiographic signs suggestive of allergy. We identified 6 patients with a diagnosis established a posteriori by allergological testing, which enabled us to find 2 additional patients corresponding to 8 patients (21% of the initial cohort). In these cases, we systematically observed metaphyseal osteolysis of the first metacarpal between 15 days and 1 month after the implantation. Clinically, most patients had an asymptomatic period of 15 days to 1 month before the onset of symptoms and osteolysis, often accompanied by local inflammation.
This study found a reproducible pattern of progression, characterised by the appearance of radiographic signs of osteolysis in the first month, followed by subsequent clinical deterioration. Although this course is strongly suggestive of a metal hypersensitivity, it is crucial not to exclude the possibility of an infectious cause, which should always be considered.

A-0127 CORRELATION BETWEEN THENAR MUSCLE THICKNESS BY ULTRASONOGRAPHIC EVALUATION AND CARPAL TUNNEL SYNDROME INSTRUMENT (CTSI)

Issei Nagura[1], Takako Kanatani[2], Atsuyuki Inui[3], Yutaka Mifune[3]
[1]Shinsuma Hospital, Kobe, Japan; [2]Kobe Rosai Hospital, Kobe, Japan; [3]Kobe University Graduate School of Medicine, Kobe, Japan

Objective: To analyze the correlation between thenar muscle thickness by ultrasonographic evaluation and Japanese version of carpal tunnel syndrome instrument (CTSI-JSSH) in carpal tunnel syndrome (CTS) patients.
Methods: Thirty-four with thenar atrophy due to CTS (13 males and 21females) with a mean age of 73.4 years (range, 54-88 years) were included in this study. The abductor pollicis brevis (APB) and opponens pollicis (OPP) muscles were evaluated by ultrasonography: The transducer was applied onto the palmer surface of the hand perpendicularly to the longitudinal axis of the first metacarpal bone. Then, both muscles were measured their thickness: the "APB depth" (from the inserted prominence of the OPP muscle above the first metacarpal bone to the palmar surface) and the "OPP depth" (from the ulnar prominence of the first metacarpal bone to the palmar surface of the OPP). Then, both muscles area was measured. The correlation between both the thenar muscle depths and CTSI-JSSH score were analyzed by Pearson's correlation coefficient (r2).
Results: The correlation between the APB depth and functional score of CTSI-JSSH (r2= -0.34) was presented. There was a significant negative correlation between the APB depth and functional score of CTSI-JSSH
Conclusions: Clinically, muscle atrophy of APB precedes the ones of OPP and brings discomfort in activities of daily living. Our ultrasonographic evaluation of thenar muscle in CTS supported the adverse value to CTSI-JSSH score.

A-0128 ARTHROSCOPIC-ASSISTED SURGERY FOR NONUNION OF SCAPHOID FRACTURES

Takaaki Shinohara, Tatsuo Watanabe, Kimitoshi Noto, Daisuke Kihira, Takamasa Masuda, Saki Saga, Atsuro Sano
Hand and Microsurgery Center, Daido Hospital, Nagoya, Japan

Objective: We have performed arthroscopic-assisted surgery for nonunion of scaphoid fractures without severe dorsal intercalated segmental instability deformity. The purpose of this study was to assess the clinical follow-up results in patients with nonunion of scaphoid fractures with arthroscopic-assisted surgery.
Methods: We retrospectively reviewed 21 patients (19 men and 2 women) with nonunion of scaphoid fractures. There were

15 Slade grade IV nonunion and 6 Slade grade V nonunion of scaphoid fractures. The mean age at the time of surgery was 29 years (range, 14-64). The mean follow-up was 19 months (range, 5-109). All patients were performed debridement of devitalized tissue or bony sclerosis of the nonunion area using small curettes or motorized burrs arthroscopically. After debridement, cancellous bone grafting into the nonunion site was performed using 2.7 mm arthroscopic cannula under dry arthroscopy. Once grafting was complete, percutaneous headless compression screw fixation was done. The wrist was immobilized with a short arm cast for 2 to 4 weeks. Preoperative and postoperative evaluations included measurement of clinical (range of wrist motion, grip strength and pain), radiographic, and self-administered upper limb disability (the Hand20 questionnaire) parameters. The Hand20 scores range from 0 to 100, with high scores indicating more disability. Postoperative complications were assessed for all patients.
Results: There were no serious surgical complications. Twenty of 21 patients had bone union. The mean duration of bone union was 6.7 weeks (range, 4-27). The one remaining patient required additional surgery 11 months after first surgery. The mean range of wrist motion significantly improved after surgery from 68% to 98% of the unaffected side. The mean grip strength significantly improved after surgery from 55% to 99% of the unaffected side. The preoperative mean numerical rating scale for pain was 4.6 and it significantly decreased to 0.5 at final follow-up. The preoperative mean Hand20 score was 36.5 and it significantly decreased to 2.7 at final follow-up
Conclusions: Arthroscopic-assisted surgery for nonunion of scaphoid fractures is minimally-invasive technique and this procedure provides satisfactory subjective and objective results in this small series.

A-0129 QUICKDASH: RELIABILITY IN THE ASSESSMENT OF CARPAL TUNNEL SYNDROME

Nicolas Bigorre[1], Ophélie Simon[2], Emilie Marteau[2], Alexandre Petit[1]
[1]Centre de la Main, Angers, France; [2]Orthopédie Traumatologie CHU Tours, France

The Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire, along with its shortened version QuickDASH, are widely used self-assessment tools for evaluating upper limb function across various acute and chronic conditions. These tools aim to standardize outcome measures globally, contingent upon certified versions and adherence to calculation guidelines. While overall reliability of the QuickDASH is established, question-by-question reproducibility and methodology have not been rigorously assessed. Carpal Tunnel Syndrome was chosen for testing the reliability of the QuickDASH.
This study aimed to evaluate the question-by-question reliability of the QuickDASH in CTS patients. Additionally, we surveyed members of the French Society of Hand Surgery (SFCM) regarding their QuickDASH usage practices and examined patients' functional expectations to correlate them with the questionnaire items. Our hypothesis suggested that response reliability might be affected by patient and practitioner factors or data collection methods.
Methods A non-interventional, single-center study was conducted from July 2023 to June 2024, including CTS patients confirmed by clinical and electrophysiological tests. Patients completed the QuickDASH three times on consecutive days. Demographic, clinical, and paraclinical data were collected, including pain medication, ease of completion, age, sex, BMI, profession, occupational health status, smoking, diabetes, thoracic outlet syndrome, and ENMG data. In October 2023, an online survey queried SFCM members on their QuickDASH application methods, response management, and knowledge of guidelines. Finally, A separate group of patients was interviewed preoperatively to describe their symptoms openly and symptoms were then compiled for analysis.
Results The QuickDASH was found easy to complete by 93.3% of patients. The intra-class correlation (ICC) scores indicated strong reliability for the overall QuickDASH, with 93% pre-operatively, 87% post-operatively, n. However, question-specific ICCs revealed less consistency, particularly for certain items post-operatively. Among surveyed practitioners,

65.5% reported that patients completed the QuickDASH autonomously, and 63.2% provided direct clarification when needed. While 58.1% of practitioners indicated the QuickDASH did not affect therapeutic decisions, 41.9% acknowledged its potential impact. Word clouds created from open-ended patient responses highlighted pain, tingling, and nocturnal symptoms as primary concerns pre-operatively.
The QuickDASH questionnaire demonstrated high reliability for measuring upper limb function in CTS patients, though some questions showed variability in their responses. Despite its widespread use, the implementation of the QuickDASH in clinical practice shows room for improvement, particularly regarding practitioner understanding and handling of missing data. The increased use of PROMs should encourage us to develop more specific tools that are closer to patients' symptoms and functional requirements

A-0130 FUNCTIONAL RESULTS OF SCAPHOCAPITATE FUSION IN THE TREATMENT OF KIENBÖCK'S DISEASE

Tomislav Palibrk[1,2], Ivana Glišović Jovanović[1,2], Aleksandra Petrović[1], Marina Brndušić[1], Mina Ilić[1], Miloš Vuruna[1]
[1]Orthopaedic and Traumatology Clinic, University Clinical Center of Serbia; [2]University of Belgrade, Faculty of Medicine

Avascular necrosis of the lunate is one of the most challenging carpal conditions for treatment which can lead to fragmentation, collapse and at the end wrist arthrosis. Treatment option usually depends on radiographical characteristics and stage of the disease. Various procedures are proposed including radial shortening, vascularized bone graft, limited wrist arthrodesis, proximal row carpectomy. In late stages (Lichtman IIIA and IIIB) scaphocapitate arthrodesis is recommended as one of the motion-preserving procedures. We are presenting functional results of 7 patients treated with scaphocapitate fusion at our department between September 2022 and September 2023 with stage III Kienböck's disease. All patients had fragmented lunate confirmed radiographically and intraoperatively. In two cases lunate was completely removed. Fixation was performed with K wires in one case and with headless compression screws in 6 cases. Postoperative period included in average 6 weeks of cast, control radiography and physical therapy after cast removal. Functional results were determined using DASH score, Mayo wrist score, grip strength using Jamar dynamometer and measuring range of motion before surgery, 1 month, 3 months, 6 months and one year after cast removal. Our results showed significant reduction of pain, satisfying range of motion and grip strength similar to contralateral side. Conclusion based on literature and our experience suggests that scaphocapitate fusion remains good option for treatment, preserving motion and reducing the pain. In case of failure, other options like proximal row carpectomy or wrist fusion can be conducted.

A-0131 EXTENDED APPLICATION OF ULNAR PARAMETACARPAL PERFORATOR FLAP FOR DIGITAL PULP RECONSTRUCTION

Satoshi Usami, Kohei Inami, Kentaro Sonoki, Sanshiro Kawahara, Masashi Takemitsu
Department of Hand Surgery, Tokyo Hand Surgery & Sports Medicine Institute, Takatsuki Orthopaedic Hospital, Tokyo, Japan

Objectives: Ulnar parametacarpal perforator flap (UPM flap), which is nourished by the perforator from ulnar digital artery of little finger, is useful for hand and finger reconstruction. We evaluate the clinical outcomes of this flap retrospectively and present application and extended indication through our clinical cases.
Materials and Methods: We reviewed 36 UMP flaps including 28 free and 8 pedicled styles for digital pulp reconstruction. Affected digit of thumb, index, middle, ring and little fingers were 3, 14, 3, 8 and 8, respectively. As combined procedure in use of this flap, we performed free bone transfer, vascularized nerve (dorsal sensory branch of ulnar nerve) transfer,

and dorsal extended flap with VY donor site closure were 5, 3 and 3 cases, respectively. Sensory recovery, range of motion, quick-DASH, complications and patient's satisfaction were evaluated postoperatively.
Results: All flaps were completely survived. Postoperative flap congestions were observed in 5 flaps, but these problems were disappeared within 2 days bloodletting. With mean 12 months follow-up, flaps achieved good sensory recovery with 8.9mm of s2PD and 5.8mm of m2PD. Mean total range of motion of affected fingers (MP+PIP+DIP) was 81.8% relative to contralateral side. As complication, there were 4 patient with the decreased sensitivity in ulnar dorsal side of little finger, but there were no complaint about it. Mean quick-DASH score was 11.1 and 33 patients (92%) were satisfied with their outcomes
Conclusions: This flap offers several advantages for pulp coverage 1) providing the similar tissue to finger pulp, 2) sensate flap, 3) low donor site morbidity, and 4) little rate of PIP joint contracture. In addition, we can harvest middle size flap (maximum 8 x 3 cm) with dorsal extended fashion. This flap has a potential to be one of the ideal selections for the volar side finger reconstruction.

A-0132 CAN THE RESULTS OF AN OBERLIN TRANSFER BE IMPROVED IN A CADAVERIC STUDY BY BRACHIORADIALIS?

Michael Weekes[1,2], Abdus Burahee[1,2], Christopher McGhee[1,2], Paul Malone[1,2], Dominic Power[1,2]
[1]University Hospitals Birmingham NHS Foundation Trust, UK; [2]Hands, Plastics and Peripheral Nerve Research Network, HaPPeN Research Team, UK

Background: Following C5 and C6 brachial plexus injury there is loss of active elbow flexion. Nerve transfers from ulnar and median nerves have been reported for restoration of function in biceps and brachialis. Double versus single fascicle transfer results are superior (MRC grade 4 score 83% vs 63.3%; p=0.013). However, fatigue of reinnervated elbow flexors remains a challenge. This study explores feasibility of transfer to biceps, brachialis and brachioradialis.
Methods: Eight fresh frozen cadavers were used to identify the motor points of the key muscles, donor nerve dissection distances and reinnervation distances using fascicle transfers. A median fascicle to biceps and ulnar nerve fascicle to brachialis and brachioradialis using an in-situ vascularised orthodromic graft of the lateral cutaneous nerve of the forearm (LCNF) to the nerve to brachioradialis was performed in each cadaver.
Results: The novel transfer from the ulnar nerve to brachioradialis using LCNF interposition graft was feasible in all 8 limbs. The average dissection distance of the Median nerve was 14.63mm (95% CI: 12.4-16.9) and ulnar nerve was 17.5mm (95% CI: 13.9 – 21.0). The median nerve to biceps reinnervation distance was 17.3mm (95% CI:12.7-21.9) to 26.4mm (95% CI: 19.1-33.6), ulnar nerve to brachialis 24.6mm (95%CI:5.1-44.0) to 41.2mm (95%CI:29.2-53.1) and ulnar nerve coaptation distance to brachioradialis 76.6mm (95%CI:68.3-85.0) to 104mm (95%CI: 82.5-126.6).
Conclusion: Nerve transfer reinnervation of the brachioradialis through a LCNF in situ graft is feasible with acceptable reinnervation distances. Clinical adoption of this modification to the traditional Oberlin nerve transfer could provide a way of reducing fatigue in the recovered elbow flexors.

A-0133 DEVELOPMENT OF A CADAVERIC TRAINING MODEL AND GRADING SYSTEM FOR SUPERCHARGING END TO SIDE NERVE TRANSFERS

Michael Weekes[1,2], Abdus Burahee[1,2], Christopher McGhee[1,2], Tahseen Chaudhry[1,2], Dominic Power[1,2]
[1]University Hospitals Birmingham NHS Foundation Trust, UK; [2]Hands, Plastics and Peripheral Nerve Research Network, HaPPeN Research Team, UK

Introduction: Supercharging End-To-Side (SETS) nerve transfers involve connecting an unaffected, expendable donor nerve to the side of an injured recipient nerve. This provides Schwann cells and axons to the distal segment of the injured nerve, potentially aiding recovery. SETS has become popular for managing high ulnar nerve injuries, where the extensive reinnervation distance often hinders complete distal motor recovery. In particular, the transfer of the anterior interosseous nerve (AIN) to the motor fascicle group of the ulnar nerve (MUN) is used to restore intrinsic motor function in the hand. However, the technical requirements for successful AIN to MUN SETS transfer are not yet standardised. This study presents a surgeon training method for the procedure, assess the quality of SETS performance, proposes a modified grading matrix for defining technical quality and evaluates its application in a cadaveric model.
Methods: A standardised cadaveric training model was developed using fresh frozen cadavers. All 12 candidates performed the AIN-to-MUN SETS using a dissection guide and fidelity matrix. Nine of these candidates (Group A) received a structured educational training package before the workshop, including a video demonstration and step-by-step guide. All candidates, including Group B (no pre-training), used a fidelity score chart to assess procedural adherence and an outcome grading matrix. Thirteen SETS procedures were completed in total, with candidates self-assessing their quality of teaching, grading from matrix, baseline readiness and confidence post-training. Two expert assessors independently evaluated technical quality, with remote re-evaluation for intra-observer variation using standardised high-definition photography
Results: Thirteen SETS transfers were successfully completed by twelve candidates, who reported pre- and post-training confidence levels. Group A, who received structured training, showed a statistically significant improvement in confidence ($p=0.0263$, $r=0.91$) using the Wilcoxon signed rank test. Candidates generally rated their performance as “Good,” though independent evaluation indicated an overestimation. A "Fair" (minimum standard for complete SETS) or better performance rating was achieved by 70% of candidates, with Group A outperforming Group B. The median quality rating for Group A was “Fair,” compared to “Poor” in Group B. Concordance between expert assessors was 40% post-dissection and 50% post-photographic review
Conclusions: The AIN to MUN SETS nerve transfer shows promise for restoring hand function in cases of high ulnar nerve injury. While the technique lacks standardisation, this study demonstrates that a structured training program can effectively guide candidates to achieve a "Fair" performance standard, irrespective of their training level. This model suggests a modified grading system for SETS quality assessment and highlights the value of structured educational tools in training complex nerve transfer techniques

A-0134 THE IMPORTANCE OF DYNAMIC ELECTROMYOGRAPHY, ELECTRICAL STIMULATION AND ULTRASOUND IN DECISION-MAKING PRIOR TO BOTULINUM TOXIN TREATMENT OR SURGICAL SELECTIVE PERIPHERAL NEURECTOMY OF UPPER LIMB MUSCLES IN PATIENTS WITH UPPER MOTOR NEURON LESIONS

Izabela Blaszczyk, Staffan Svenlin, Per Jenmalm
Department of Diagnostic and Intervention, Hand and Plastic Surgery, Umeå University, Sweden

Assessing the upper limb (UL) in patients with upper motor neuron lesions (UMNL) is crucial for achieving optimal treatment outcomes with botulinum toxin (BoNT-A) or surgical interventions. The deformities observed in the UL of UMNL patients

arise from various factors, including paresis, co-contractions, spasticity, and other movement disorders. Typically, soft tissue changes occur, leading to alterations in joint mobility. Evaluating UL functional impairment is typically conducted by a multidisciplinary team. Commonly used assessment tools include range of motion, strength testing, spasticity evaluation, pain assessment and movement analysis. However, none of these tools provide comprehensive insights into the condition of specific muscles, despite treatment methods such as BoNT-A injections, selective peripheral neurectomy (SPN), or tendon and muscle surgery target individual muscles. The patterns of muscle activity and structural changes in patients with UMNL vary significantly and differ between muscles.

Dynamic electromyography (dEMG) provides the ability to assess a specific muscle's activity at rest and the presence or absence of voluntary motor control, and the muscle's response when stretched. Ultrasonography (USG) allows us to measure muscle volume, evaluate the quality of muscle fibers, and observe muscle behavior both at rest and during movement. When combined with electrical stimulation (ES), these modalities enable visualization of a muscle's response to electrical stimuli or the lack thereof. This information is particularly vital in making decisions regarding muscle denervation, whether through BoNT-A or SPN. The latter approach has seen a significant increase in usage over the past decade. Although SPN has been the subject of various publications, guidelines on "when and how much" remain underexplored.

At our clinic, we have utilized dEMG and ES in combination with USG for several years. Our growing experience with these technologies has led us to better assess the UL in UMNL patients and individualize treatment. In our presentation, we will detail the equipment we employ, how we conduct examinations, what information we gather, and how we interpret these findings when determining muscles suitable for BoNT-A treatment or SPN.

Keywords: upper motor neuron lesion, upper limb assessment, dynamic electromyography, selective peripheral neurectomy, muscle ultrasonography,

A-0135 MULTICENTER RANDOMIZED CONTROLLED TRIAL ON NONOPERATIVE VERSUS OPERATIVE TREATMENT FOR ACUTE COMPLETE TEARS OF THE ULNAR COLLATERAL LIGAMENT OF THE THUMB: PRELIMINARY RESULTS

V. van de Lucht[1,2], L. de Haas[1,2], B. van Hoorn[1,2], N. Schep[7], M. Dijkgraaf[3], J. Debeij[5], B. Derksen[7], A. Greeven[5], M. Engelen[16], J. de Jong[11], C. van Laarhoven[14], A. Leijdesdorff[6], M. Leliveld[16], M. Leszczynksi[9], B. Meesters[9], E. Nijs[16], A. Ottenhof[13], K. Reisinger[9], J.S. Reinders[11], T. Saltzherr[6], S. Stougie[14], A. Tan[4], R. van Veen[4], D. Van der Velde[8], G. van der Bij[13], F. van der Pluijm[11], R. van Vugt[9], B. Weitenberg[5], P. Wittich[8], O. Wijers[14], W. Willems[6], Y. den Ouden[6], H. Zwaving[11], M. van Heijl[1,2]

[1]Diakonessenhuis Utrecht, the Netherlands; [2]UMC Utrecht, the Netherlands; [3]Amsterdam UMC, the Netherlands; [4]OLVG Amsterdam, the Netherlands; [5]Haga ziekenhuis, the Netherlands; [6]Haaglanden Medisch centrum, the Netherlands; [7]Maasstad Rottedam, the Netherlands; [8]Antoniusziekenhuis Utrecht, the Netherlands; [9]Zuyderland, the Netherlands; [10]Groene hart ziekenhuis, the Netherlands; [11]Martini ziekenhuis Groningen, the Netherlands; [12]Flevoziekenhuis, the Netherlands; [13]Spaarne gasthuis, the Netherlands; [14]Franciscus gasthuis, the Netherlands; [15]St Jansdal, the Netherlands; [16]UZ Leuven, Belgium

Current guidelines recommend operative treatment followed by cast immobilization for acute complete ulnar collateral ligament (UCL) ruptures, including Stener lesions. This recommendation is based on expert opinion, anatomical theories, and low-quality observational studies. High-quality studies comparing non-operative treatment to operative treatment are lacking. We hypothesized that primarily non-operative treatment with cast immobilization (cast immobilization) is non-inferior regarding functional outcome and carries concomitant lower costs compared with immediate operative treatment followed by cast immobilization (operative treatment) for complete UCL ruptures, including Stener Lesions. This study is a multicenter randomized controlled non-inferiority trial (RCT), including patients of 18 years and above, requiring treatment for an acute complete UCL rupture, including Stener Lesions. Patients were randomized to cast immobilization

or operative treatment followed by cast immobilization. Immobilization consisted of four weeks of a non-removable cast around the metacarpophalangeal (MCP) and carpometacarpal (CMC) joint of the thumb in a neutral position, followed by a removable cast for four weeks for both groups. Patients in the cast immobilization group were re-evaluated two to three weeks after the start of cast immobilization to examine thumb stability. In case of persistent laxity, secondary surgery was required. The primary outcome is hand function expressed as the Michigan Hand outcome Questionnaire (MHQ) at six months (from injury to six months after). Preliminary results from this study will be presented at the conference, with patient inclusion ending on March 31, 2024. If cast immobilization is non-inferior to operative treatment, the proposed treatment strategy will reduce patient burden by preventing surgery. It is expected that about one in ten patients who started with cast immobilization will need secondary surgery during re-evaluation. As a result, completion of the treatment will take longer for these patients compared to patients who received immediate operative treatment.

A-0136 A RESTROSPECTIVE STUDY OF 43 CASES OF TOTAL WRIST DENERVATION

Davide Gravina, Andrea Manfredi, Filippo Pantaleoni, Norman Della Rosa
AOU di Modena - SC Chirurgia della Mano e Microchirurgia

Background: Most patients with post-traumatic and/or degenerative wrist arthritis present with pain and limitation of activities of daily living. Particularly in young patients or those who need to return to activities that require strength, surgery such as proximal row carpectomy or partial or total wrist arthrodesis may result in failure to return to activities, especially work.
In selected patients with specific functional needs, total wrist denervation with two incisions technique is an alternative to proximal row carpectomy and partial or total wrist arthrodesis and it can play a key role in the management of pain symptoms and the return to work or strength activities.
Methods: A cohort of fifty-four patients, mean age 57 years, operated on in a single center by two different senior surgeons were included in the study. Various etiologies of wrist pain were recorded with 54% of patients having SNAC or SLAC. PRWHE, VAS scale and range of motion were tested at 2 years follow-up.
Results: 71.5% of the population underwent surgery on the dominant limb. After clinical evaluation we recorded a mean of 15.75 (0-45.5) of PRWHE, with joint motion of 69,63° 16,73 (20°-90°) in flexion, 68,43° 17,41 (20°-90°) in extension, 80,18° 11,40 (50°-90°) in pronation, 80,46° 11,06 (50°-90°) in supination. The mean VAS score was 2,33 1,89 (0-5 points). No re-operations were recorded
Conclusions: A retrospective analysis of our case history has shown that total denervation of the wrist provides excellent clinical, functional and analgesic results, allowing a full return to work.
The perfect candidate is a patient at least 55 years old, with a SLAC or SNAC grade greater than or equal to 2, who performs an activity that requires the use of force and may be limited by the use of more invasive techniques.
In these patients, it is an optimal technique because it allows the patient to continue working until retirement while limiting their pain symptoms. Moreover, since it is a minimally invasive technique and easy to perform, it can be proposed to the patient and only then, if the technique fails, can more invasive techniques be adopted, such as proximal row carpectomy and partial or total wrist arthrodesis.

A-0137 EVOLVING TECHNIQUES IN SPASTIC HAND SURGERY: PROXIMAL ROW CARPECTOMY FOR FUNCTIONAL IMPROVEMENT

Richarda Böttcher, Ulrike Schnick, Martin Aman, Julia Glaser
Germany

Background: Spasticity and subsequent contractures significantly impair hand function in individuals suffering from cerebral or spinal disorders. Fixed flexion of the wrist, particularly with ulnar drift, inhibits function also in cases with voluntary motion of fingers and thumb. In primary absence of voluntary use a reliable wrist extension results quite often in simple grip and grasp function or allow hidden voluntary abilities to appear. Fixed contractures like swan neck deformities improve due to the relaxation. In consequence achieving reliable wrist extension is essential for optimizing the use of a spastic hand. Thus, surgical interventions must aim to alleviate contractures and tension around the wrist prior to facilitating wrist extension.
Methods: This study investigates the role of proximal row carpectomy within the surgical treatment for spastic hands. Over a 10-year period, 19 proximal row carpectomies were performed as part of a comprehensive surgical approach for patients affected by spasticity. The study includes analysis of intraoperative findings, postoperative outcomes and long time improvements in hand function
Results: Intraoperative evaluation revealed severe chronic osteochondral changes, including cartilage loss and lunate necrosis. In two cases advanced lunate necrosis and resulting pain was the primary indication for surgical treatment. Notably, two patients required bilateral surgery, and temporary fixation of the carpal configuration was necessary in only one case. No surgery-related complications, such as infection or dislocation, were observed. In one case reconstruction of hand function was initially realized without a proximal row carpectomy, which had to be added some months later to minimize the tension around the wrist.
Indication of proximal row carpectomy was handled restrictive in the first cases, but the clinical results encouraged to perform a proximal row carpectomy in all cases, where combined tenotomies and tissue release failed to facilitate passive wrist extension. Follow-up assessments indicated no painful changes, with significant reductions in dyskinesia and spasticity, enhancing the patients´ability to engage in daily activities.
Discussion: Proximal row carpectomy proves to be an effective surgical procedure for patients with spastic hands. The absence of complications and the long-term improvement in hand function underscore its value in a combined surgical treatment of spasticity-related conditions.

A-0138 A GLOBAL SURVEY ON DIAGNOSTIC WORKUP AND TREATMENT OF THUMB ULNAR COLLATERAL LIGAMENT INJURIES

V. van de Lucht[*,1,5], I. Legerstee[*,2,3], A. Luan[2], M. van der Oest[3], B. van der Heijden[4], K. Eberlin[2], N. Chen[2], J. Zuidam[3], M. van Heijl[1,5]
[1]Diakonessenhuis Utrecht, the Netherlands; [2]Massachusetts General Hospital, Boston, Massachusetts; [3]Erasmus University Medical Center Rotterdam, the Netherlands; [4]Jeroen Bosch Ziekenhuis, the Netherlands; [5]UMC Utrecht, the Netherlands; [*]Shared first authorship

Thumb ulnar collateral ligament (UCL) injuries are common in plastic, orthopedic, and trauma care. However, an optimal approach to diagnose and treat these injuries remains debatable, largely due to limited high-quality evidence. This study aims to gain global insights into diagnostic and treatment practices used by hand surgeons for thumb UCL injuries, providing

a comprehensive overview of current practices. This cross-sectional survey included trauma, plastic, and orthopedic surgeons managing thumb UCL injuries. The survey was developed with clinical experts and included questions on diagnostic methods, imaging use, and treatment practices. The survey was distributed online to ensure broad international participation. Over 200 responses have been collected from surgeons worldwide, across multiple continents. Comprehensive data analysis is underway, with results to be presented at the conference, offering a detailed overview of global trends and common practices that may inform future guidelines. This study addresses a critical gap in the literature by highlighting the current diagnostic and treatment strategies for thumb UCL injuries among hand surgeons worldwide. The findings may support the development of standardized, evidence-based protocols.

A-0139 THE USE AND PATIENT PERCEIVED BENEFIT OF WRIST ORTHOSIS DURING THE FIRST THREE MONTHS AFTER SURGERY FOR DISTAL RADIUS FRACTURE

Ingrid Andreasson[1,2], Eva Andersson[3], Elisabet Hagren[4], Joakim Strömberg[1,5]
[1]University of Gothenburg, Sahlgrenska Academy, Department of Clinical Sciences, Gothenburg, Sweden; [2]Department of Occupational Therapy, Sahlgrenska University Hospital, Mölndal, Sweden; [3]Department of Occupational Therapy, Alingsås lasarett, Alingsås, Sweden; [4]Department of Occupational Therapy, Kungälvs sjukhus, Kungälv, Sweden; [5]Department of Surgery and Orthopaedics, Alingsås lasarett, Alingsås, Sweden

Background: Most patients with surgically treated distal radius fractures are assigned removable wrist orthoses to wear for support after cast removal. The evidence regarding how the patients use the orthosis over time and their perception of its merits is scarce.
The aim was to investigate how much of the time patients use orthosis during the first three months postoperatively and their perception of the merits of the orthosis.
Methods: This is a prospective study with week-by-week assessment of the use and perceived benefit of orthoses after open reduction and volar plating following distal radius fracture. Fifty-five patients (mean age 60 years) were included. The patients registered their daytime and nighttime use of orthoses and rated the importance by Visual Analogue Scale during eleven weeks after cast removal
Results: The mean number of weeks until the patients ceased using orthoses daytime was 9 weeks after surgery. By then, more than 50% of the patients had stopped using their orthosis daytime and only 3% of the patients used it all through the day. 50% had stopped using their splint at night, while 16% of the patients used it every night. The mean reported importance of the orthosis declined from 8.4/10 during the first week after cast removal to 1.4/10 at 13 weeks
Conclusions: This study provides novel detailed information on the use and patient-perceived importance of a common adjuvant treatment after surgery for distal radius fracture. The study shows that most patients discontinue using orthoses within two months after removal of the cast.

A-0140 LONG TERM OUTCOMES OF ULNAR COLLATERAL LIGAMENT INJURIES OF THE THUMB, A SINGLE CENTRE PROSPECTIVE CASE SERIES

V. van de Lucht[1,2], J. Konigs[1,2], J. Spikker[1,2], M. van Heijl[1,2]
[1]Diakonessenhuis Utrecht, the Netherlands; [2]UMC Utrecht, the Netherlands

Thumb ulnar collateral ligament (UCL) injuries range from ligament sprains and partial tears to full-thickness tears, which may require surgical intervention, especially in the presence of a Stener lesion. While both nonoperative and operative

treatments generally yield favorable results, there is limited data on the long-term, patient-reported outcomes and the need for secondary interventions in this patient population. This prospective case series evaluated long-term outcomes in patients with UCL injuries of the thumb treated between 2018 and 2021 at a single institution. Eligible patients were identified retrospectively and invited to complete the Michigan Hand Outcomes Questionnaire (MHQ) to assess hand function, pain, and satisfaction. Additional patient and injury data was collected from their medical records. A multivariable linear regression analysis was performed to examine associations between injury characteristics and outcomes, with statistical significance set at $p < 0.05$. Data collection and analysis are underway. Findings on long-term outcomes, rates of secondary interventions, and factors associated with MHQ scores will be available at the conference. This study aims to enhance understanding of long-term outcomes in thumb UCL injuries, identify risk factors associated with poor recovery, and inform clinical decision-making. The findings may support the development of evidence-based guidelines for managing UCL injuries to optimize patient outcomes.

A-0141 STAKEHOLDERS' VIEWS ON TREATMENT OPTIONS FOR COMPLETE THUMB ULNAR COLLATERAL LIGAMENT RUPTURES AS INPUT FOR DECISION CARDS TO PROMOTE SHARED DECISION-MAKING: A QUALITATIVE INVENTORY

V. van de Lucht[1,2], S. Verkerk(1)[,2], D. Ubbink[3] M. van Heijl[1,2]
[1]Diakonessenhuis Utrecht, the Netherlands; [2]UMC Utrecht, the Netherlands; [3]Amsterdam UMC, the Netherlands

Complete ruptures of the thumb ulnar collateral ligament (UCL) are often managed surgically, but conservative treatment may be equally effective. As both treatment options come with various advantages and disadvantages, clear counseling is essential for patients, and their preferences regarding treatment options need to be incorporated in the decision-making process. Decision cards can support shared decision making by presenting patients with clear information to guide treatment choices in alignment with evidence-based information and the patient's values and preferences. The aim of this study is to identify patients' considerations during the treatment decision- making process and determine the information needed for a patient to be able to participate in the treatment decision-making process. The goal is to develop online downloadable decision cards for clinicians and patients with thumb UCL injuries to facilitate shared decision-making about the treatment options. We conducted a qualitative study involving focus groups and interviews with adult patients who had experienced thumb UCL ruptures. Participants were recruited using purposive sampling to ensure a diverse representation. Data collection took place between November and December 2024. Interviews and focus groups were recorded, transcribed, and thematically analyzed to identify key themes that would inform decision card content. Decision cards were then developed and tested for applicability, usability, comprehensibility, and satisfaction. Results will be available by the time of the conference. Expected outcomes include patients' considerations during the treatment decision-making process and the information needed for a patient to be able to participate in the treatment decision-making process. Decision cards covering core questions will be the final product of this study. The decision cards will be made available as downloadable resources.

A-0142 RELIABILITY AND VALIDITY OF DUTCH MICHIGAN HAND QUESTIONNAIRE IN HAND FRACTURE PATIENTS: RECOMMENDATION FOR SUBSCALES OVER OVERALL SCORE

V. van de Lucht[1,2], L. de Haas[1,2], S. de Wolf[3], M. van Heijl[1,2]
[1]Diakonessenhuis Utrecht, the Netherlands; [2]UMC Utrecht, the Netherlands; [3]Amsterdam UMC, the Netherlands

The Michigan Hand Questionnaire (MHQ) is a widely used tool for evaluating hand function, generally reported as an overall score derived from its six subscale scores. However, when an instrument measures different constructs on its subscales, it is considered multidimensional, making it invalid to report an overall score. Doing so risks masking the information provided by each subscale and potentially reduces the sensitivity and impact of the results. Additionally, the measurement properties of a patient-reported outcome measure depend on the population in which it is tested. This clinimetric study aims to evaluate structural validity, internal consistency, and construct validity, of the Dutch version of the MHQ in patients with a traumatic metacarpal or phalangeal fracture of the hand. MHQ data from three months post-injury, obtained from the Snapshot study conducted across twelve hospitals in the Netherlands, was used. To investigate structural validity, factor analysis was performed. Internal consistency was determined using Cronbach's alpha. Construct validity was evaluated by comparing the MHQ scores of clinically relevant, a priori hypothesized subgroups. The sample comprised 442 adult patients. Factor analysis confirmed the questionnaire's multidimensionality and identified six subscales, consistent with the original version of the MHQ. The internal consistency of the subscales was good. Construct validity was supported by the differences in MHQ scores between the a priori hypothesized subgroups. Furthermore, the subscale scores generally demonstrated more distinct differences between the subgroups than the overall score. The Dutch version of the MHQ demonstrated good reliability and validity of all subscales in patients with a traumatic metacarpal or phalangeal fracture of the hand. However, the multidimensional structure of the questionnaire makes it inappropriate to report an overall score.

A-0143 SYSTEMATIC MAPPING REVIEW OF APPLICATIONS OF EXTRACORPOREAL SHOCKWAVE THERAPY (ESWT) IN HAND SURGERY

Ryan Faderani[1], Zhen Yu Wong[2], Oluwatobi Adegboye[3], Muholan Kanapathy[1], Afshin Mosahebi[1]
[1]Division of Surgery and Interventional Science, University College London, London, UK; [2]Pilgrim Hospital, Boston, England, UK; [3]Faculty of Biology, Health and Medicine, University of Manchester, Manchester, England, UKAim: This systematic mapping review aims to systematically identify, elucidate, and categorise existing evidence regarding the utilisation of shockwave therapy in hand surgery.

Methods: Adhering to the PRISMA guideline, we conducted a thorough search to identify studies investigating the application of shockwave therapy in hand surgery. Data extraction followed predetermined eligibility criteria, and evaluated outcomes were systematically classified into four dimensions: clinical assessment, Patient-Reported Outcome Measures (PROMs), neurophysiological tests, and a miscellaneous category
Results: A total of 43 studies were incorporated, comprising 9 case series, 1 cohort study, and 33 randomised controlled trials (RCTs). Most investigations focused on carpal tunnel syndrome, with other conditions, including trigger finger, Dupuytren's disease, post-CTRS pillar pain, hypertrophic hand scar, Kienbock's disease, de Quervain tenosynovitis, osteoarthritis, and scaphoid wrist nonunions, also examined. Most investigations reported short-term benefits in clinical and PROMs outcomes, with complications being infrequent and of mild nature. The delivery protocol for shockwaves exhibited heterogeneity in terms of intensity and frequency. Observations on shockwave intensity and frequency's dose dependency for clinical

efficacy, reported in some studies, remain inconclusive. A majority of RCTs exhibit a high/moderate risk of bias. Limited evidence supports the beneficial impact of shockwave therapy in the other hand conditions.
Conclusion: Standardisation of shockwave therapy frequency and intensity is imperative. The administration of shockwave therapy reveals a dose-dependent effect devoid of major complications, with noteworthy short-term efficacy, primarily serving as an adjunct. While the literature is robust for CTS, meticulously designed RCTs are indispensable for comprehending the efficacy in other hand surgical conditions.

A-0144 WAFER TRIAL: A FEASIBILITY RANDOMISED CONTROLLED TRIAL COMPARING WALANT TO GENERAL AND REGIONAL ANAESTHESIA WITH TOURNIQUET FOR FLEXOR TENDON REPAIR

Muholan Kanapathy[1,2], Ryan Faderani[1,3], Juliette Bray[1], Martha De La Cruz Monroy, Fawz Kazzazi[10], Matthew Pywell[10], Hakim-Moulay Dehbi[4], Monica Panca[4], Cecilia Vindrola-Padros[5], Anjana Prasad[6], Nicola Burr Grad[2], Norman Williams[2], Yazan Al-Ajam[1], Waseem Bhat[7], Jason Wong[8,9], Afshin Mosahebi[1,2], Dariush Nikkhah[1,2,3]
[1]Department of Plastic and Reconstructive Surgery, Royal Free NHS Foundation Trust Hospital, London, United Kingdom; [2]Division of Surgery & Interventional Science, University College London, United Kingdom; [3]Faculty of Medical sciences, University College London, United Kingdom; [4]Comprehensive Clinical Trials Unit, University College London, United Kingdom; [5]Department of Targeted Intervention, University College London, United Kingdom; [6]Department of Anaesthesia, Royal Free NHS Foundation Trust Hospital, London, United Kingdom; [7]Department of Plastic and Reconstructive Surgery, Leeds Teaching Hospitals NHS trust, Leeds, United Kingdom; [8]Department of Plastic and Reconstructive Surgery, Manchester University NHS Foundation Trust, Manchester, United Kingdom; [9]Blond McIndoe Laboratories, Division of Cell Matrix Biology and Regenerative Medicine, Manchester Academic Health Science Centre, School of Biological Sciences, Faculty of Biology, Medicine and Health, The University of Manchester, Manchester, United Kingdom; [10]Royal London Hospital, London, United Kingdom

Aims: We aim to evaluate the feasibility of WALANT as an alternative to GA and RA in patients undergoing surgical repair of flexor tendon injuries.
Method: WAFER is a multicentre, single-blinded, parallel group, randomised controlled trial (RCT) to assess the feasibility of WALANT versus RA and GA in patients with acute traumatic flexor tendon injuries, across 4 major hand surgery units in England. Outcome assessors were blinded. The primary outcome was the ability to recruit patients into the trial, while secondary outcomes include difference in functional outcome, patient-reported outcome measures, health-related quality of life, cost-effectiveness and complication rates. Fifteen semi-structured online interviews were conducted with clinicians across participating hospital sites, thematic analysis of the interview data was conducted using Rapid Research Evaluation and Appraisal Lab (RREAL) sheets.
Ethical approval: London-City and East Research Ethics Committee (22/PR/1197)
Results: Quantitative analysis: 58 patients recruited; 30 in WALANT, 28 in RA/GA. WALANT had shorter anesthesia duration (12.17 ± 8.56 vs. 24.31 ± 17.95 mins, $p = 0.01$) and lower total intervention cost (£$771.95 \pm$ £69.77 vs. £$1251 \pm$ £323.87, $p < 0.00001$). Complication rates were similar; 8.7% rupture rate in GA/RA vs 8.3% in WALANT. Qualitative analysis: Clinicians noted patient priorities (return to work) affecting trial participation and personal anesthesia preferences potentially biasing recruitment
Conclusions: No significant outcome differences observed between groups, however significant cost disparities and time efficiency favour WALANT. Furthermore, this study underscores the importance of qualitative insights in the pre-trial phase to uncover potential challenges in trial design.

A-0145 OUTCOMES OF NERVE TRANSFER AND GRAFTING FOR SHOULDER RECONSTRUCTION AFTER TRAUMATIC INJURY TO THE SUPRACLAVICULAR BRACHIAL PLEXUS

Tim Hems
*Scottish National Brachial Plexus Injury Service, Queen Elizabeth University Hospital, Glasgow, UK**Aim: This study reviews outcomes and complications of reconstruction for shoulder movement, including accessory to suprascapular nerve transfer, after traumatic supraclavicular brachial plexus injury.*

Methods: Patients who had undergone accessory to suprascapular nerve transfer between 2001 and 2023 were identified from the prospective service database. Details recorded included age, mechanism of injury, delay between injury and operation, the extent of the brachial plexus injury, and the type of reconstruction for the axillary nerve and elbow flexion. Accessory to suprascapular nerve transfers were carried out via an anterior approach after exploration of the supraclavicular plexus. When possible, the axillary nerve was repaired separately by nerve grafts from C5 or transfer of the medial head triceps branch of the radial nerve. Evaluation included MRC muscle grading, range of active shoulder abduction against gravity, and range of active external rotation

Results: There were 39 patients, 36 men and three women, with a mean age of 30 years (range 14 – 67) at the time of operation. The cause of injury was a road accident in 33 cases, a fall from height in 3, assault for one, and iatrogenic injury for one. Mean delay between injury and operation was 98 days (median 80, range 11 – 414). Sixteen patients had injury to C5-6 nerve roots, 11 to C5-7, seven to C5-8, and five had C5 -T1 complete plexus injuries.

In 32 cases repair was performed for the axillary nerve including nerve grafts from C5 in 17, transfer from the medial head triceps nerve in 13, and intercostal nerves in two.

Follow-up for more than a year was available for 35 patients, mean 36 months (range 14 – 111). Twenty had MRC grade of 3 or greater for supraspinatus and 14 for deltoid. Mean active shoulder abduction was 86° (range 30 – 180) with 21 having 80° or more. Mean external rotation was 1° (range -40 – 70) with 19 able to rotate to neutral or beyond.

For 14 patients who had nerve grafts for reinnervation of the axillary nerve, mean shoulder abduction was 101° (40 – 180), whereas for 11 triceps branch transfers abduction was 75° (30 – 160) ($p=0.15$). The results were poor in three patients over age 50. There was a trend towards better outcomes in C5-6 compared with more extensive injuries.

Four patients, who had good recovery in deltoid, were observed to have scapular instability because of weakness of the middle and lower trapezius after the accessory nerve transfer

Conclusions: Accessory to suprascapular nerve transfer combined with reconstruction of the axillary nerve after supraclavicular brachial plexus injury can provide satisfactory active shoulder abduction. External rotation is less predictable. Despite the trend towards use of nerve transfers, nerve grafts should be considered for reconstruction of the axillary nerve if the C5 root is viable. It is important to be aware of the risk of scapular instability after accessory nerve transfer.

A-0146 TIPS AND TRICKS TO ACHIEVE OSTEOTOMY HEALING AND PREVENT REFRACTURE AFTER ULNAR SHORTENING OSTEOTOMY

Chi-Hoon Oh[1], Myoung Jae Oh[2], Jong Woo Kang[1]
[1]Korea University Ansan Hospital, Ansan, Republic of Korea; [2]Seoul Hospital, Seoul, Republic of Korea

Parallel osteotomy is essential for favorable osteotomy reduction and healing and is technically challenging during diaphyseal ulnar shortening osteotomy (USO). This study evaluated the advantages of guided osteotomy for parallel

osteotomy and reduction osteotomies, healing over freehand osteotomy. It also aimed to identify surgical factors affecting healing after diaphyseal USO. Between June 2005 and March 2016, 136 wrists that had undergone diaphyseal USO for ulnar impaction syndrome (UIS) were evaluated. The wrists were divided into two groups according to the osteotomy technique (group 1: freehand osteotomy, 74 wrists; group 2: guided osteotomy, 62 wrists). The osteotomy reduction gap and time to osteotomy healing (union and consolidation) were compared between the groups. A multiple regression test was performed to identify the surgical factors affecting healing. The cut-off length of the reduction gap to achieve osteotomy union on time and the cut-off period to decide the failure of complete consolidation were statistically calculated. The baseline characteristics did not differ between the two groups. The osteotomy reduction gap, time to osteotomy union, and complete consolidation were shorter in group 2 than in group 1 ($p = 0.002$, < 0.001, 0.002). The osteotomy reduction gap was a critical surgical factor affecting both time to osteotomy union and complete consolidation ($p < 0.001$, < 0.001). Using a dynamic compression plate affected only the time to complete consolidation ($p < 0.001$). The cut-off length of the osteotomy reduction gap to achieve osteotomy union on time was 0.85 mm. The cut-off period to decide the failure of complete consolidation was 23.5 months after osteotomy. The minimal osteotomy reduction gap was the most important factor for timely osteotomy healing in the healthy ulna, and guided osteotomy was beneficial in reducing the osteotomy reduction gap.

A-0147 RESULTS OF THE NERVE TRANSFERS AND SECONDARY PROCEDURES TO RESTORE SHOULDER AND ELBOW FUNCTION IN TRAUMATIC UPPER BRACHIAL PLEXUS PALSY

Piotr Czarnecki, Michał Górecki
Department of Traumatology, Orthopaedics and Hand Surgery, Poznan University of Medical Sciences, Poznań, Poland

Damage to the upper trunk of the brachial plexus, often caused by high-energy trauma, leads to significant functional impairment of the upper limb. This injury primarily affects the C5 and C6 roots, resulting in paralysis of muscles critical for shoulder and elbow function. If spontaneous nerve regeneration does not occur within 3-6 months post-injury, surgical intervention, including nerve transfers, is recommended to restore function. This study evaluates long-term outcomes of nerve transfer surgeries performed between 2013 and 2023 on 16 adult patients with post-traumatic brachial plexus injuries. The most common cause of injury was motorcycle accidents. Nerve transfers targeted shoulder and elbow function restoration, including the transfer of accessory nerve to suprascapular nerve, the radial nerve branch to the long or medial head of the triceps brachii to the axillary nerve or the transfer of motor fascicles of the ulnar and median nerves (double Oberlin) to the brachialis and biceps brachii motor nerves. Postoperative results showed varying degrees of functional recovery. In the shoulder, most patients achieved stabilization and partial restoration of active movement, with average flexion up to 92° and abduction up to 78°. In the elbow, full flexion with M4 strength was achieved in 64% of patients. In both the shoulder and the elbow, double nerve transfers yield better long-term outcomes than single transfers. Secondary procedures, such as tendon transfers, were required in some cases to improve limb strength. The study concludes that nerve transfers offer reliable outcomes in restoring upper limb function, although additional surgeries may be necessary in certain cases.

A-0148 POPULATION NORMS FOR HAND GRIP AND PRECISION GRIP STRENGTHS IN POLISH CHILDREN AND ADOLESCENTS AGED 3–19

Michał Górecki, Marta Kazarców, Agnieszka Protasewicz, Piotr Czarnecki, Leszek Romanowski
Department of Traumatology, Orthopaedics and Hand Surgery, Poznan University of Medical Sciences, Poznan, Poland

Background: Normative data on hand and precision grip strengths are essential for evaluating the level of development, the efficacy of rehabilitation, and treatment results. The need for established norms of grip strength in Polish children is one of the problems that Polish physiotherapists and physicians face when treating upper limbs. The aim was to establish normative values of hand and precision grip strengths in Polish children and adolescents aged 3–19.
Methods: In the years 2012–2023, a sample of 358 children and adolescents with no history of upper limb injuries or congenital upper extremity defects were randomly chosen from kindergartens, primary schools, middle schools, and high schools. They were living in urban agglomerations and smaller towns or villages. Hand and precision grips like the pincer, three-point, side, and opposition grip strength were assessed using a hand dynamometer and pinchmeter in standard positions.
Results: The strength in all types of examined hand grips increases with chronological age in both genders. The grip strength was higher in the boys' group than in the girls' and it was higher in the right hand than in the left, but the difference was no greater than 10%. Detailed data with standard deviation were presented in the form of a table, divided by age and sex
Conclusions: Norms for grip strength were provided for Polish children and adolescents aged 3–19, allowing therapists and physicians to compare Polish patients with that of normally developed, healthy children of the same age and sex.

A-0149 ABNORMAL COURSE OF DORSAL SENSORY BRANCHES OF ULNAR NERVE: CASE SERIES

Myung jae Oh[1], Chi-Hoon Oh[2], Jong woo Kang[2]
[1]Seoul Hospital, Seoul, Republic of Korea; [2]Korea University Ansan Hospital, Ansan, Republic of Korea

A dorsal sensory branch of the ulnar nerve commonly arises from the ulnar nerve at the distal thirds of the forearm and at the level of the ulnar styloid process; it is situated dorsally and medially. It is mandatory to know the anatomical course of the dorsal sensory branches of the ulnar nerve in surgical and medical procedures dealing with ulnar-sided wrist or distal ulna. In this report, we present a case of an abnormal course of dorsal sensory branches of the ulnar nerve. The abnormality was observed in the ulnar shortening osteotomy of the right forearm of a 38-year-old female. The dorsal sensory branch of the ulnar nerve ran ulnodorally across the ulnar border of the forearm at proximal 4 cm from the ulnar styloid process in this case. To our knowledge, this type of variation has never been published before. This type of variation may be useful during surgeries and electrophysiological examinations of the area.

A-0152 SCAPHO-METACARPAL DUAL MOBILITY PROSTHESIS FOR TMC-1 JOINT SALVAGE: TECHNICAL INSIGHTS

Julia Glaser[1,2], Martin Aman[1,2], Thomas Krohn[3], Joris Duerinckx[4], Benjamin Panzram[5], Leila Harhaus[1,2]

[1]BG Klinikum Unfallkrankenhaus Berlin, Germany, Department of Hand-, Replantation- and Microsurgery, Chair of Hand-, Replantation- and Microsurgery, Charité Universitätsmedizin Berlin; [2]BG Trauma Center Ludwigshafen, Germany, Department of Hand, Plastic and Reconstructive Surgery, Burn Center Department of Hand surgery, Peripheral Nerve Surgery and Rehabilitation Plastic and Hand Surgery, University of Heidelberg; [3]St Franziskus-Hospital, Ahlen, Germany, Section Orthopedic, Trauma and Reconstructive Surgery, Ahlen; [4]Ziekenhuis Oost-Limburg, Genk, Belgium, Departement of Orthopaedic Surgery and Traumatology; [5]University Hospital Heidelberg, Germany, Section Upper Extremity, Orthopedic University Hospital Schlierbach, Heidelberg

Introduction: Rhizarthrosis, or osteoarthritis of the trapeziometacarpal (TMC-1) joint, is a common degenerative condition that significantly impacts thumb functionality, especially in older adults. Standard treatments, such as trapeziectomy with ligament reconstruction or tendon interposition, often achieve satisfactory outcomes. However, in cases where primary interventions fail, patients may experience persistent pain, instability, and limited thumb mobility. Revision options are limited, with few techniques adequately addressing anatomical restoration and functional recovery

Aim: This study aims to provide technical insights into the surgical approach and outcomes of scaphometacarpal total joint arthroplasty using a dual mobility implant as a solution for failed trapeziectomy cases. We focus on the procedural techniques, implant selection, and the technical challenges associated with this revision surgery.

Methods: We retrospectively reviewed 13 scaphometacarpal arthroplasty procedures using the Touch® dual mobility prosthesis in 11 patients aged 52–80 who presented with persistent symptoms following trapeziectomy. Key surgical steps included preparation of the scaphoid and metacarpal bases to accommodate the implant, careful alignment of the components to restore the natural biomechanics of the thumb, and use of the dual mobility design to maximize joint stability. Technical insights emphasize achieving correct implant positioning to restore thumb length, ensuring stable fixation, and balancing soft tissues to minimize the risk of dislocation and ensure functional range of motion

Results: At an average follow-up of 16 months, patients demonstrated substantial improvement in thumb function and pain relief. Grip strength was restored to 80–90% of the contralateral hand, and the average Kapandji opposition score improved to 9/10, indicating near-normal opposition. Radiographic evaluations confirmed successful osseointegration, stable implant positioning, and absence of loosening or dislocation. Technical challenges encountered included maintaining the stability of the scaphoid component and preventing subluxation in cases with compromised soft tissue integrity. Only one patient experienced a complication in the form of a scaphoid fracture that precluded implantation, while another reported mild hypesthesia, which did not affect overall functionality.

Conclusion: Scaphometacarpal arthroplasty with a dual mobility prosthesis appears to offer significant technical advantages for patients requiring revision surgery after failed trapeziectomy. This technique addresses critical technical aspects such as restoring thumb length, improving joint stability, and enhancing opposition function, thus providing both pain relief and functional recovery. The dual mobility design minimizes the risk of dislocation and offers robust joint stability, making it a promising option for complex revisions. However, precise implant alignment, soft tissue balancing, and careful intraoperative handling are essential to avoid complications and achieve optimal outcomes. Further studies are recommended to evaluate the long-term durability of this technique and compare it with other revision strategies, potentially establishing it as a standard approach for failed trapeziectomy cases.

A-0153 EFFECTIVENESS OF NON-OPERATIVE METHODS OF TREATMENT OF CARPAL TUNNEL SYNDROME: A NARRATIVE REVIEW

Andrzej Zyluk, Filip Flicinski
Department of General and Hand Surgery, Pomeranian Medical University in Szczecin, Poland

Introduction: Carpal tunnel syndrome (CTS) can be treated with several methods, including surgical and non-surgical techniques. Non-surgical methods include wrist splinting, systemic pharmacotherapy, intracarpal injections of steroids hydrodissection, acupuncture, nerve and tendon mobilization, osteopathy, taping, topical application of ointments, laser, ultrasound and shock-wave therapies. These treatments are generally less effective than surgery, and provide only short-lived effect, but it may be quite sufficient for a certain category of patients, particularly those suffering from mild symptoms. Over the last years, these techniques have attracted increasing popularity, because they offer non-invasive option for surgical treatment what can be attractive for some patients. However, although these methods were shown in the literature, their actual effectiveness has not been scientifically verified.
The objective of this study was a review of the effectiveness of non-operative methods of treatment of CTS.
Methods: A review of the published literature from PubMed and Medline databases on the effectiveness of non-operative treatments of was done.
Results: The review indicates that each of the presented methods is effective in reduction of symptoms and improvement of hand function in CTS patients, but their effect is only short-lived. None of these treatments provides a permanent cure, like does surgical treatment.
Conclusion: In spite of numerous non-operative treatments of CTS, surgery is the only method that provides permanent recovery.

A-0156 RESULTS OF THE TREATMENT OF CARPO-METACARPAL JOINTS DISLOCATIONS: A CASE-SERIES STUDY

Andrzej Zyluk
Pomeranian Medical University in Szczecin, Poland. Department of General and Hand Surgery

Carpometacarpal (CMC) joint dislocations are rare, accounting for less than 1% of all hand
injuries. They are result of a direct high-energy blow to the hand, i.e. fall on the outstretched hand, fall from the bike or punching against an object. The patients frequently disregard these injuries and do not seek medical advice promptly, which is why they present with neglected dislocations.
The objective of this case-series study was an analysis of the results of the treatment of these injuries in 6 patients who presented to author institution.
Patents and Methods. In the years 2021-2023 (3-year period), 6 male patients, in a mean age of 39 years, with CMC joints dislocations were treated. Three patients had single CMC joint dislocation and other three had 2 or 3 CMC joints dislocation. Three patients had concomitant fractures of metacarpal bones or the hamate. Four patients were treated operatively, one conservatively, and one patient with neglected injury was given physiotherapy. Results were assessed at an average of 16 months post-treatment by a telephone interview in 5 patients
Results: None of the patients reported pain at rest in his hand and 4 reported mild pain after heavier load of the hand. Two patients reported minor pain when the weather changed. Function of the hand as assessed with quickDASH form was normal. All patients believed that they fully recovered and all returned to the same job as before injury.
Concussion. The cases-series presented here show satisfactory outcomes of the treatment of CMC joints dislocations, both in isolated injuries and in complex cases.

A-0157 RECURRENCE AFTER SURGERY FOR DUPUYTREN'S DISEASE: AN ANALYSIS OF CAUSES AND INCIDENCE

Andrzej Zyluk
Pomeranian Medical University in Szczecin Poland. Department of General and Hand Surgery

Background: The incidence of recurrence Dupuytren's disease after surgery is estimated up to 50% in relation to progression of the disease, treatment modality and time of the follow-up.
The objective of this study was an analysis of the causes and frequency of recurrences in patients following surgery for recurrent Dupuytren's disease. in the authors' institution in the years 2016–2018.
Materials and Methods: Sixty-seven patients, 56 men (83%) and 11 women (17%) at a mean age of 59 years (range 40–81) were treated in the authors' institution in the years 2020-2022 because of recurrent Dupuytren's disease. Of this number 27 patients (40%) underwent a 2nd operation to the same hand, 22 patients (33%) a 3rd operation, 14 (21%) a 4th operation, and the remaining 4 patients underwent more than 5 operations on the same hand. The defined rate of recurrence in the analyzed period was 20%. The mean time interval from the last operation and the appearance of signs of a relapse was 14 months; in 42 patients (63%) it was less than 1 year (3–12 months) and in the remaining 25 (37%) from 1 to 4 years. Progressing contracture of the previously operated finger and contracture of the adjacent finger which was not involved at the 1st operation, was the most frequently observed pattern of recurrence, found in 29 patients; it was a combination of true recurrence and extension of the disease. The number of operations performed in a given patient was found to be a statistically significant risk factor of recurrence.

A-0159 FUNCTIONAL IMPAIRMENT OF THE EXTREMITIES IN PATIENTS WHO GOT OVER COMPLEX REGIONAL PAIN SYNDROME

Andrzej Zyluk and Filip Flicinski
Pomeranian Medical University in Szczecin Poland. Department of General and Hand Surgery

Complex regional pain syndrome (CRPS) is a descriptive term for a complex of symptoms and signs, including pain, swelling and vasomotor disturbances. The disease causes also functional impairment of the affected extremity and limitation in daily activities. Even after effective treatment, the condition frequently leaves residual symptoms and impairment of the limb. The objective of this study was assessment of the level of functional impairment in patients who got over CRPS. Materials and methods. Fifty-two patients, 45 women (86%) and 7 men (14%) in a mean age of 57 years who were got over CRPS were asked to fill 2 questionnaires for assessment of function of their upper limbs in daily living. The questionnaires included the Raadboud Skills Questionnaire (the RASQ) and the Disability of Arm, Shoulder and Hand (the DASH). Results of this study show statistically significant differences in functional impairment of the limbs between the groups with different recovery status and duration of CRPS: the patients with longer lasting disease and those, who did not feel recovered showed greater functional impairment of their limbs than remaining patients. Conclusion. These results suggest that, in spite of a satisfactory outcome of treatment, significant long-term sequelae of the disease impair function of the affected limbs and reduce quality of life in a proportion of patients.

A-0160 GREEN SURGERY. A COMPARISON OF COSTS AND ENERGY EXPENDITURE DURING COMMON HAND SURGERY OPERATIONS PERFORMED IN THE OPERATING THEATRE VERSUS PROCEDURE ROOM AT THE SURGICAL WARD

Andrzej Zyluk, Bernard Piotuch
Department of General and Hand Surgery, Pomeranian Medical University in Szczecin, Poland

Introduction: The health care sector is the fifth largest contributor to greenhouse emissions globally. Results of several studies have demonstrated that altering surgical practices from inpatient to outpatient service was associated with cost savings, reduction of medical waste and energy expenditure.
The objective of the study was comparison the costs of materials and energy expenditure at common hand surgery operations performed in the operating theatre and in a ward procedure room settings.
Material and methods: The analysis included the cost of materials, cost of sterilization of surgical instruments and energy expenditure for sterilization generated at standard hand surgery operations, including, carpal tunnel release, surgery for Dupuytren's disease, benign tumor and ganglion cyst excision, de Quervain's disease, or trigger finger release.
Results: Typical hand surgery operations performed in a procedure room at the surgical ward generated lower costs (amounting to 53% of main theatre costs), 1 kg less clinical waste and were associated with significant (67%) reduction in energy expenditure compared to surgeries performed in the main operative theatre.
Conclusion: Altering of organization of doing surgeries in a ward procedure room instead of the main operative theatre was associated with a significant positive effect on economy and environment.

A-0161 LONG-TERM OUTCOMES OF THE TREATMENT OF DISTAL RADIAL FRACTURES: A NARRATIVE REVIEW

Andrzej Zyluk
Pomeranian Medical University in Szczecin Poland. Department of General and Hand Surgery

The objective of this study is analysis the literature on the long-term (minimum 3 years) clinical and functional outcomes of treating distal radial fractures with different methods, to get insight into the possible superiority of the treatment methods (operative vs conservative) over the others.
Methods: A randomized clinical trials and observational studies reporting on functional and radiological outcomes of distal radial fractures treated conservatively, or conservatively vs operatively, in adult patients found in PubMed and Medline databases were reviewed.
Results: Nine studies were found meeting inclusion criteria for analysis. The range of follow-up periods varied from 3 to 14 years, the size of the analysed groups ranged from 32 to 342 persons and the mean age of patients ranged from 18 to 76 years. All the papers reported that long-term functional outcomes after surgical vs conservative treatment did not differ significantly. All studies reported better radiological outcomes after surgical treatment and worse outcomes for plaster cast immobilization, with concomitant high re-dislocations rate and frequent malunion. This, however did not translate into worse clinical outcomes. We noticed some significant bias in analyzed studies that significantly affect the reliability and validity of drawn conclusions.
Conclusion: Presented review show that treatment outcomes of distal radial fractures are generally good, regardless of the method used. Current literature does not provide uniform evidence to prove superiority of a particular treatment method when looking at long-term functional outcomes. Conservative treatment by close reduction and plaster cast immobilization seem to be still a good option of the treatment of these fractures, particularly in older patients.

A-0162 LONG-TERM RESULTS AFTER CLOSED REDUCTION AND K WIRES FIXATION FOR DISTAL RADIAL FRACTURES

Andrzej Zyluk, Victoria Dabrowska
Pomeranian Medical University in Szczecin Poland. Department of General and Hand Surgery

Distal radius fracture is the most common upper extremity fracture in the elderly population. Treatment options for these fractures vary from non-operative treatment by close reduction and casting to several operative fixation techniques. The results of these treatments were published in many papers, but only a few reported long-term outcomes.
This study aims to analyse the long-term results of the operative treatment of distal radial fractures conducted in the authors' institution
Material and methods. In the years 2018-2019, 235 patients who sustained distal radial fractures were treated in the authors' institution by close reduction and K-wire fixation. The patients were contacted by phone to arrange a follow-up examination at 5 years after the injury. From the entire group, 24 patients agreed to visit the authors' institution for a follow-up examination. The study group comprised 24 patients, 20 women (83%) and 4 men (17%) at a mean age of 59 years. Assessment methods included pain intensity, wrist movements, grip strength and subjective evaluation of hand function, using a set of 3 questionnaires (the DASH, the PEM and the PRWE).
Results. Most patients (79%) declared no pain in their wrists, and 5 (21%) had mild pain, mostly after heavier load or weather changes. Wrist movements were generally very good, with only about 10% lower than movements of a healthy wrist. In most patients, the grip strength of the affected hand was the same as that of the healthy hand. Only two patients had significantly reduced grip strength of up to 60% compared to the healthy hand. Subjective evaluation of hand condition with questionnaires yielded positive results on average, with only one patient experiencing significant dysfunction in her hand.
Conclusion. The long-term follow-up results of the present study demonstrate that almost all patients (96%) after distal radius fractures treated with percutaneous K-wire immobilization regain normal hand function.

A-0163 OUTCOMES OF SURGERY FOR METASTASES OF MALIGNANT NEOPLASMS TO THE HAND

Andrzej Zyluk
Pomeranian Medical University in Szczecin Poland. Department of General and Hand Surgery

Metastases of malignant neoplasms to the hand are very rare, constituting approximately 0,01% of whole distant metastases. They usually indicate generalized neoplastic disease, although sometimes can be a first manifestation of dissemination.
The aim of this study was analysis of outcomes of the treatment of four patients with metastases of malignant neoplasms to the hand.
Results. The study presents 4 cases of metastatic tumours to the hands in patients with diagnosis of renal (2) and lung cancer (1) and one of unknown point of origin. The lesions were localized in the fingers in two patients and in the wrist in other two. The patient with wrist involvement received excisional biopsy of the lesion, followed by forearm amputation. Two patients with finger tumours had their affected fingers amputated. The patient with the cyst involving the wrist received local excision of the lesion. Operative wounds healed uneventfully in all patients, but 3 of them eventually died within one year from hand operation.
Conclusion. Surgical treatment of for metastases of malignant neoplasms to the hand consists in amputation in most cases, since all these patients have generalized neoplastic disease.

A-0167 SIMPLE THUMB PROSTHESIS: A CHEAP AND USEFUL ALTERNATIVE TO EXPENSIVE AND COMPLEX SOLUTIONS

Andrzej Zyluk
Pomeranian Medical University in Szczecin Poland. Department of General and Hand Surgery

Traumatic of oncologic amputation of the digit (digits) is fairly common injury affecting the upper extremities. Amputation of the thumb causes significant disability as loss of the thumb accounts for 40% of the entire loss of hand function. In the case of thumb amputation, replantation is the best option, allowing almost full recovery of the hand function. However, for various reasons, replantation is not always possible or successful and in these cases other methods of thumb reconstruction such as toe-to-thumb transfer, lengthening procedures and index pollicization are considered. Other, reasonable option is use of various prostheses such as naked prostheses, vacuum-retained prostheses, or osteo-integrated prostheses. In the article we present a case of young men who underwent amputation of the distal phalanx of his thumb in right (dominant) hand due to malignant tumour. He had relatively long stump of the digit and he found in the internet simple thumb prostheses made of rubber material, which were advertised as stage props and toys used to depict magic tricks. Total cost of the prosthesis was 20 PLN. He started using it in his daily activities and at work. At follow-up at 3 months after amputation the patient filled the DASH questionnaire and obtained score of 8 points, indicating normal hand function, both with and without the prosthesis. However, in the subscale "professional activity" the difference of 4 points appeared, favouring using a prosthesis. The patient reported also that use of prosthesis allows him to tie laces in his shoes, fasten clothes buttons and use scissors more efficiently. The patient believes that this simple prosthesis makes for him easier performing activities of daily living and professional work.

A-0169 FINGER MYOPERICITOMA: EXPANDING THE DIFFERENTIAL FOR PAINFUL HAND NODULES

João C. Pereira, Ana Vilela, Juvenália Ribeiro, Luis Rodrigues, Pedro Varanda, Elisabete Ribeiro
Hospital de Braga, Portugal

Myopericytoma is a rare benign soft tissue tumour characterized by a myoid-perivascular pattern, often located in the lower extremities but also reported in other organs such as the kidneys and stomach. Finger presentation is rare and often misdiagnosed as simple epidermal cysts. To our knowledge, this case of finger Myopericitoma represents the eleventh case reported in the literature. We present a case of a 47-year-old female with a Myopericytoma in the volar aspect of the second digit.

The patient presented with a progressively enlarging nodule on her D2 volar MCP joint over several months. She reported occasional pain with certain activities but was otherwise asymptomatic. Physical examination revealed a palpable nodule on the volar surface of D2, which was non-tender on palpation. Ultrasound imaging showed a subcutaneous well-circumscribed lesion vascular soft tissue mass. Subsequent MRI demonstrated a well-defined, subcutaneous lesion measuring approximately 9x7x6 mm, hyperintense on T1-weighted images, and on T2-weighted images. The lesion displayed no aggressive features, and differential diagnoses included other benign soft tumours such as giant cell tumour. Given the symptomatic nature and potential for further growth, surgical excision was performed. A meticulous dissection allowed complete removal of the nodule. Histopathological examination revealed a well-defined mesenchymal neoplasm composed of proliferations of spindle-shaped myoid cells with multilayered, concentric growth around numerous small thick-walled blood vessels consistent with the characteristic histology of Myopericytoma.

Postoperatively, the patient reported satisfaction with the outcome, experiencing no pain and complete range of motion. This case underscores the need for awareness of such a rare entity in the hand and the role of imaging, particularly MRI,

in guiding surgical management. While benign, Myopericytoma should be considered in the differential diagnosis of small, slow-growing painful nodules in the hand, particularly when imaging features suggest a vascular component.

A-0172 TECHNOLOGY AND INNOVATION IN HAND THERAPY: A BIBLIOMETRIC ANALYSIS

Hasan Atacan Tonak
University of Health Sciences, Hamidiye Faculty of Health Sciences, Department of Occupational Therapy, Istanbul, Turkey

Objective: Although there is evidence that technology and innovative approaches used in hand therapy are successful in achieving an effective and motivating outcome, no bibliometric analysis has been conducted to date. The aim of this study was to conduct a bibliometric analysis to identify the current state of research, development, and trends related to technology and innovation in hand therapy.
Methods: Publications for bibliometric analysis were obtained from the Web of Science Core Collection database. The search strategy was as follows: "hand" AND "technology" OR "hand" AND "innovation" OR "hand therapy" AND "technology" OR "hand therapy" AND "innovation" OR "hand rehabilitation" AND "technology" OR "hand rehabilitation" AND "innovation" OR "upper extremity" AND "technology" OR "upper extremity" AND "innovation" OR "upper limb" AND "technology" OR "upper limb" AND "innovation". To focus the search, the search was limited to "topic" rather than "all fields" and included only research articles and reviews. At the same time, publications in the Web of Science Categories "rehabilitation", "engineering biomedical", "surgery", "neurosciences", "clinical neurology", "orthopedics", "robotics", "pediatrics", "geriatrics gerontology", and "rheumatology" were selected. VOSviewer package program was used for bibliometric analysis of publications, years, countries, authors, author collaboration networks, institutions, journals, citations, references, and keywords
Results: 3341 of 51306 articles published until 2024 were included in the study. With 306 publications, 2022 was the year with the highest number of publications. The authors who contributed the most to research on technology and innovation in hand therapy was Lancioni, G.E. and Sigafoos, J. (n=26). The United States of America (n=1183) ranked first among the countries where the most publications were produced. It was determined that the most publications were produced by researchers affiliated with the University of Toronto (n=67). The Journal of NeuroEngineering and Rehabilitation (n=116) published the most articles on this topic. The most cited article was the study by Cadena, C. et al. (2016) (n=2112). The most frequently used keywords were "rehabilitation", "stroke", "assistive technology", "virtual reality", and "upper limb"
Conclusions: In recent years, technology and innovation have become important research topics for hand therapists. Especially since 2019, more than 200 articles have been published every year until today, revealing that the interest in these studies is increasing day by day. This bibliometric analysis examines publications on current technological and innovative approaches in hand therapy and provides information on the latest approaches and developments to researchers, clinicians and evidence-based practitioners who are interested in the subject for the first time and/or are already working in this field.

A-0173 THE APPLICATION OF A MICROSURGERY ROBOTIC SYSTEM IN EMERGENCY HAND TRAUMA CARE

Khaled Dastagir, Peter M. Vogt
Plastic, Aesthetic, Hand and Reconstructive Surgery, Hannover Medical School, Hannover, Germany

The utilization of robotic systems for supermicrosurgery has gained popularity in recent years. Robot-assisted microsurgery offers advantages such as reduced risk of tremor and fatigue, but also presents challenges including longer learning

curves and lack of haptic feedback. The Symani Microsurgery Robotic System exemplifies this advanced technology, revolutionizing microsurgical procedures by combining precision and dexterity.
Methods: We present the results of 62 anastomoses of blood vessels under 0.8 mm in diameter performed during emergency treatments of severe hand injuries. Thirty-one anastomoses were conducted using the Symani system, while the other 31 were performed manually as a control group. Patient characteristics, including gender, age, and risk factors, were matched between groups
Results: No significant differences were found in the duration of anastomoses between the Symani system (arterial: 17.3 $\pm$ 1.9 min; venous: 11.5 $\pm$ 1.3 min) and manual technique (arterial: 16.1 $\pm$ 1.4 min; venous: 10.2 $\pm$ 1.8 min). Moreover, the learning curve showed continuous improvement over time, with the tenth procedure taking 30% (arterial) and 16.7% (venous) less time compared to initial attempts.
Discussion: Our study demonstrates that the application of robot-assisted microsurgery is promising, yielding results comparable to hand-sutured procedures in our clinic. Experienced microsurgeons can anticipate increased comfort and improved concentration when performing clean anastomoses using the robotic system, especially during nighttime procedures. Furthermore, the Symani system enables suturing of blood vessels with very small diameters with utmost precision, potentially opening new options in finger replantation surgery.
Conclusion: The integration of the Symani Microsurgery Robotic System in emergency hand trauma care shows potential for enhancing surgical outcomes and expanding the capabilities of microsurgical procedures. Further research is warranted to fully elucidate the long-term benefits and applications of this advanced technology in clinical practice.

A-0175 INITIATIVES FOR OSTEOPOROSIS MANAGEMENT IN PATIENTS AFTER DISTAL RADIUS FRACTURES

Mika Akahane, Akari Mori, Kensyo Suzuki, Tada Kaoru, Satoru Demura
Department of Orthopaedic Surgery, Graduate School of Medical Sciences, Kanazawa University, Japan

Introduction: Osteoporosis is a significant risk factor for fractures, especially among older adults following distal radius fractures. Prior evaluations highlighted that despite a high prevalence of osteoporosis in these patients, both bone mineral density (BMD) assessments and subsequent therapeutic interventions remain insufficient. In response, we developed a treatment protocol and conducted a multicenter prospective study aimed at establishing a system to improve osteoporosis management. This study assesses whether the intervention could increase rates of BMD examinations and osteoporosis treatment.
Methods: Patients aged 50 years or older with distal radius fractures were recruited from our hospital and three affiliated institutions, excluding cases involving high-energy trauma or pathological fractures. At the initial visit, patients underwent BMD assessments, spine radiographs, and evaluations for previous fragility fractures and current osteoporosis treatments. According to the protocol, patients with BMD below 80% of the young adult mean or with a history of vertebral or proximal femoral fractures were started on pharmacologic treatment for osteoporosis. BMD tests and spine radiographs were repeated annually for up to five years post-injury to monitor for secondary fractures, regardless of pharmacologic intervention status
Results: From October 2021 to May 2024, 140 patients (12 males and 128 females, mean age 70.4 years) participated in the study, with 25 managed conservatively and 115 requiring surgical intervention. The injury mechanism was falls from a standing position in 118 cases, falls from stairs in 20 cases, and traffic injuries in one case, with no cases related to sports injuries or high-impact trauma. Prior fragility fractures were noted in 39 patients, with osteoporosis diagnosed in 82% of participants. Among those diagnosed, 93% received pharmacologic treatment: 77 initiated new medications, 10 adjusted pre-existing treatments, and 20 continued prior medications. Of the 97 patients who were more than one

year post-injury, 76 were available for follow-up. Among these, only one case of secondary fracture (a vertebral fracture) was observed, yielding a one-year cumulative incidence rate of 1.3%.
Discussion and Conclusion: Effective osteoporosis management following distal radius fractures requires a proactive approach by orthopedic surgeons, as individual efforts may be insufficient. In addition to establishing an osteoporosis liaison service, we developed a treatment protocol to increase the osteoporosis treatment rate. This multicenter, organized approach reflects a community-wide commitment to addressing osteoporosis management. The institution of this protocol achieved significant improvements in BMD examination and osteoporosis treatment rates among patients following distal radius fractures.

A-0176 CARPAL TUNNEL SYNDROME AS A RED FLAG FOR CARDIAC AMYLOIDOSIS: A RETROSPECTIVE STUDY

Mika Akahane, Akari Mori, Kensyo Suzuki, Tada Kaoru, Satoru Demura
Department of Orthopaedic Surgery, Graduate School of Medical Sciences, Kanazawa University, Japan

Introduction: Cardiac amyloidosis is a progressive and potentially life-threatening disease characterized by cardiac hypertrophy and arrhythmias. The recent approval of tafamidis as a treatment underscores the importance of early detection. Carpal tunnel syndrome (CTS) has been recognized as a potential early indicator, or "red flag," for cardiac amyloidosis, often presenting 5–10 years prior to a formal diagnosis, particularly in older adults with bilateral symptoms. This study investigates the prevalence of amyloid deposits in CTS patients and assesses their association with cardiac amyloidosis, with a focus on older individuals.
Methods: A retrospective study was conducted on 50 CTS patients who underwent carpal tunnel release surgery between October 2022 and January 2024, excluding those on dialysis. The cohort included 18 men and 32 women, with an average age of 71.2 years (range: 39–88). Synovial tissue from the flexor tendons was collected during surgery and examined histologically for amyloid deposits using Congo red or Direct fast scarlet staining. In cases where amyloid deposits were detected, immunostaining identified the type of amyloid, with transthyretin amyloidosis (ATTR) being the primary focus. Patients confirmed with ATTR amyloidosis were subsequently referred for cardiology assessment to evaluate for cardiac amyloidosis. Statistical analysis utilized the Mann-Whitney U test for age differences and Pearson's X^2 test for gender and side of involvement, with significance set at $p < 0.05$
Results: Of the 50 patients, 18 (36%) showed amyloid deposition, all identified as ATTR. Among the ATTR-positive cases, 7 patients (39%) were male, and 14 (78%) had bilateral CTS. Cardiac amyloidosis was diagnosed in 6 of the 18 ATTR-positive cases, indicating a 33% incidence of cardiac amyloidosis among amyloid-positive patients. Comparisons between patients with and without amyloid deposits revealed that amyloid-positive individuals were significantly older, but there were no significant differences in gender or side of CTS involvement. Among the six cardiac amyloidosis cases, two patients started tafamidis treatment, while the remaining three were monitored without medication due to lack of indication for tafamidis.
Discussion and Conclusion: Our findings demonstrate that 36% of CTS patients exhibit amyloid deposition, with a substantial proportion (33%) also having underlying cardiac amyloidosis. This prevalence is higher than previously reported rates of cardiac amyloidosis among CTS cases with amyloid deposits. The significantly older age of amyloid-positive patients suggests age as a risk factor for amyloid accumulation and its progression to cardiac disease. These results underscore the necessity of evaluating amyloid deposits in middle-aged and elderly CTS patients, regardless of gender or laterality, as they may have an undiagnosed cardiac condition. Given that amyloid-positive CTS cases may already have developed cardiac amyloidosis, cardiology assessment is essential for timely intervention and management.
Keywords: carpal tunnel syndrome, carpal tunnel release, amyloid, cardiac amyloidosis, transthyretin amyloidosis

A-0177 SUCCESSFUL TREATMENT OF POLYURETHANE GROUT HIGH-PRESSURE INJECTION INJURIES WITH CONTINUOUS CATHETER IRRIGATION AFTER SURGICAL DEBRIDEMENT

Wang Qiao
Singapore General Hospital, Singapore

Introduction: High-pressure injection injuries to the hand can have devastating sequelae, leading to eventual amputation and poor functional outcomes, especially with non-water-soluble material. Polyurethane Grout is a hydrophobic chemical grout. It has aggressive expansion in tissue and densely blended with the soft tissue. High pressure jet injury by such material has significantly high risk of amputation even with thorough surgical debridement. We report one case with Polyurethane Grout high pressure jet injury treated by continuous catheter irrigation after surgical debridement with successful preservation of the injured finger.

Case report: Patient is a 47 year-old male with Polyurethane Grout high pressure jet injury to his left index finger. He arrived to emergency department 5 hours after the injury. On examination, his left index finger appears to be pale and dusky. The grout material is visible over the entry wound at volar proximal phalanx. X-ray showed soft tissue gas extending along the entire finger down to the palm. Intra-operatively, we found that the grout material was filled in both volar and dorsal subcutaneous plane. It was also filled in flexor tendon sheath and space around extensor tendon. The neurovascular bundles were densely encased.

We performed thorough surgical debridement to remove the grout material as much as possible. We the inserted a infant feeding catheter to perform continuous irrigation in the ward with rate of 5ml/L. The wound was closed primarily. The irrigation was stopped on POD 4 and the catheter was removed.

He had wound care regularly and received aggressive occupational therapy post-operatively. Currently his wound was healed nicely. His finger was still stiff with total active range of motion about 90 degrees.

Discussion: High pressure jet injury causes tissue damage by (1) initial in jury, (2) chemical irritation, (3) inflammation, and (4) secondary infection. We used continuous catheter irrigation after surgical debridement to continuously and actively wash the affected finger. It helps to wash off debris and dilute the inflammatory factors so that to suppress overt inflammation, prevent infection and eventually minimise tissue damage. In this case, we successfully avoided amputation of the affected finger and preserved reasonable function for the patient.

A-0178 PRENATAL ULTRASONOGRAPHIC DETECTION OF CONGENITAL UPPER LIMB MALFORMATIONS

Ida Neergård Sletten[1,2], Mona Irene Winge[1]
[1]Division of Orthopaedic Surgery, Oslo University Hospital, Oslo, Norway; [2]Faculty of Medicine, University of Oslo, Oslo, Norway

Background: Approximately 100 children with congenital upper limb malformations (CULA) are born annually in Norway, estimated from the Stockholm incidence of 21.5 per 10.000 newborns. Most Norwegian pregnant women have a prenatal fetal ultrasound screening performed by midwives in their local hospitals at gestational week 18 or 19. Several types of CULA can be detected from 10-12 weeks. We have no previous knowledge of prenatal detection of CULA in Norway. We aimed to find how many CULA are detected prenatally, which subtypes have the highest detection rate, and if more associated anomalies and/or syndromes are found in children with prenatally detected CULA than in children with a CULA detected at birth.

Material and methods: In the CULA North Oslo Registry, we prospectively classified CULA, associated anomalies, and/or syndromes in all consecutive patients with CULA between May 2018 and September 2024 (n=780). After written consent

from the family of 636 (82%) patients, we collected information regarding the time of CULA detection (by ultrasound (correctly described or not), at birth, later, or unknown)

Results: Of the 636 patients, 405 (64%) had a CULA that was immediately detected at birth, and in 231 (36%) it was detected later in life (from days to several years postnatally). Prenatal ultrasound screening was performed in 380 (94%) of the 405 patients with a CULA detected at birth. Of these, a CULA was detected prenatally in 37 (9.7%), and according to the caregivers, with a correctly diagnosed subtype in 26 (6.8%). Excluding 3/37 patients born abroad, 23 were born at University Hospitals and 11 at local or regional hospitals.

Among the 37 patients with a prenatally detected CULA, the largest subgroup was a transverse reduction defect (12/56, 21%). The defect was above the wrist level in 11 and below the wrist in one (symbrachydactyly type peromelia, lacking all fingers). A CULA was detected in 5/31 patients with radial longitudinal deficiency, 12/81 with ulnar polydactyly, 3/9 with amyoplasia, 2/17 with amniotic band syndrome, 1/3 with Apert syndrome, 1/16 with ulnar longitudinal deficiency and in 1/23 with proximal radioulnar synostosis. No patients with radial polydactyly (n=59) or cleft hand (n=9) were diagnosed prenatally.

Compared to patients with a CULA detected at birth, more patients with a prenatally detected CULA had associated organ anomalies (16/37 vs 79/343, p=0.015). We found no significant difference between the two groups regarding bilateral CULA, associated spine and/or lower extremity anomalies, or syndromes.

Conclusion: Only 10% of patients with a clinically detectable CULA at birth were diagnosed at prenatal ultrasound screening, and a majority of these were born in University Hospitals. The highest detection rate was found for proximal transverse reduction defects. The patients with a prenatally detected CULA had more organ anomalies, which might reflect a more thorough ultrasound examination of the fetal upper limbs due to other pathological findings.

A-0179 IMMOBILISATION WITH COMPRESSION BANDAGE VS. ANTEBRAQUIAL SPLINT IN DISTAL RADIUS FRACTURES OPERATED BY OPEN REDUCTION AND LOCKING PLATE. RANDOMISED CLINICAL TRIAL

José Ignacio Miró[1], Alfonso García Vaquero-pina[1], Ángela Sierras Cristiá[2], Juan Ignacio Duca[3], Alejo García Bensi[3], Gustavo Luis Gómez Rodríguez[3], Adolfo Galán Novella[1], Alberto Izquierdo Fernández[4]

[1]Hand, Elbow and Microsurgery Unit Icatme-Quirón Dexeus Hospital, Barcelona, Spain; [2]Orthopedic Surgery and Traumatology Department, Santa Ana Hospital, Granada, Spain; [3]Upper Limb Unit, Buenos Aires Hand Clinic (CLIMBA) Buenos Aires, Argentina; [4]Orthopedic Surgery and Traumatology Department, Reina Sofia University Hospital, Cordoba, Spain

Introduction: Currently, there is a lack of prospective studies to unify criteria about type and time for postoperative immobilisation in surgical distal radius fractures. The aim of this study is to compare functional and radiological results in two groups of distal radius fractures treated with internal fixation with locking plate, and immobilised with antebrachial splint or compression bandage for 3 weeks.

Material and methods: A randomised clinical trial was carried out with two parallel groups with 3, 6, and 12 weeks of follow-up. Main and secondary functional variables were measured, such as pain on VAS scale, values on PRWE, DASH and MRS scale, range of motion in flexion---extension, complications, etc. In addition, some radiological variables were measured at preoperative period and one week after surgery, such as union time, dorsal displacement, shortening, ulnar variance, etc

Results: A total of 62 patients were evaluated: 27 immobilised with bandage and 35 with splint. Analysis of the results obtained showed significant differences in both groups for almost all radiological variables from pre to postoperative period, and for all functional variables from 3 to 12 weeks after surgery. No significant differences were found between the two groups for any of the radiological and functional variables evaluated (VAS 3-12 weeks: p = .584; PWRE 3-12

weeks: p = .248; flexion range of motion 3-12 weeks: p = .959; extension range of motion: p = .50; union time: p = .89)
Conclusions: We do not find clinical or radiological differences between immobilisation with antebrachial splint or compression bandage for distal radius fractures operated with locking plate. A greater number of patients and follow-up are necessary to extrapolate the results to the general population and to establish criteria for good postoperative management of these fractures.

A-0180 FALLING INCIDENCE OF OBSTETRIC BRACHIAL PLEXUS INJURY IN SCOTLAND: A STUDY OVER 18 YEARS

Tim Hems, Archie Todd-Hems
Scottish National Brachial Plexus Injury Service, Queen Elizabeth University Hospital and Royal Hospital for Children, Glasgow, United Kingdom

Introduction: Incidence of obstetric brachial plexus injury (OBPI) has been estimated as 1 to 2 per 1000 births. However, precise estimates of the incidence of are difficult to establish partly because of the spectrum of severity of OBPI and therefore variation in criteria for diagnosis. This study aims to report an accurate incidence of cases of "true" obstetric brachial plexus injury (OBPI), defined as those who have a persisting deficit beyond two months of age, over the last 18 years and analyse change over this period.
Methods: Numbers of cases and incidence of OBPI among children born in Scotland (population 5.5 million) was studied over an 18-year period by analysing the prospective database of the national brachial plexus injury service which is the only referral centre in Scotland. Data collected included number of referrals, number of true OBPI cases born in each year and Narakas group. Medical records were reviewed to confirm diagnosis of OBPI. Incidence was calculated using number of births in Scotland for each year
Results: From 2006 to 2023, 776 children were referred to the service. After exclusion of those with transient lesions there were 103 new cases of "true" obstetric brachial plexus injury, defined as those who have a persisting deficit after the age of 2 months, a mean of 6 per year (range 1 – 13). The mean annual incidence was 0.11 per 1000 live births (range 0.02 - 0.22), with a downward trend to around 0.05 per 1000 births in the last five years. There were 49 cases during the first 5 years and 14 during the last 5 years. Fifty-four children were classified as having Narakas group 1 lesions, 39 group 2, five group 3, and five group 4. There has also been a downward trend in the number requiring exploration of the brachial plexus, six in the first 5 years and only two in the last 5 years. Injury severity appears to be declining with 10 of 14 cases in the last 5 years being Narakas group 1.
Summary: These results indicate a considerably lower incidence of OBPI cases with persisting neurological deficit than previously reported internationally. The incidence is falling, suggesting that prevention of injuries of sufficient severity to cause long term deficit is possible by changes in obstetric practice. Of note the rate of caesarian section in Scotland has risen from 9% in 1975 to 24% in 2006 and 35% in 2020. However, introduction of guidelines and regular mandatory simulation training for management of shoulder dystocia is likely to have contributed to the reduction.

A-0182 FRACTURE OF THE RADIAL SESAMOID BONE OF THE THUMB ASSOCIATED WITH VOLAR PLATE INJURY

Marcelo Alves, Søren Tofte
Odense Universitetshospital, Denmark

The fractures of sesamoid bones of the hand are rare, especially when associated to volar plate injury. We report a case of fracture of the radial sesamoid of the metacarpophalangeal (MCP) joint of the thumb associated to avulsion of the distal insertion of the volar plate. The trauma mechanism was hyperextension of the thumb after a direct trauma from a fall during a handball match, which resulted in pain and edema with gross instability of the MCP joint in extension. No ulnar collateral ligament was suspected clinically. X-ray confirmed the fracture. The treatment consisted in open exploration, repair and reinsertion of the volar plate associated to a cerclage of the radial sesamoid with non absorbable sutures, resulting in excellent stability in flexion and extension. Sesamoid fractures are indicators of severe hyperextension injury and can be associated with tears of the volar plate, especially if there is joint instability on physical examination. Failure to recognize the volar plate injury may lead to a long-term hyperextension instability on pinching. The authors stress the indication for surgical exploration and repair of volar plate injuries in the thumb MCP joint if there is a sesamoid fracture associated to MCP joint instability.

A-0183 ANTERIOR PLATING TECHNIQUE FOR DISTAL RADIUS: COMPARING PERFORMANCE AFTER LEARNING THROUGH NAIVE VERSUS DELIBERATE PRACTICE

Cafarelli Laurine[1], Laela El Amiri[1], Sybille Facca[1,2], Nabil Chakfé[3], Marie-Cécile Sapa[1], Philippe Liverneaux[1,2,3]
[1]ICube CNRS UMR7357, Strasbourg University, Strasbourg, France; [2]Department of Hand Surgery, Strasbourg University Hospitals, FMTS, Strasbourg, France; [3]Gepromed, Bâtiment d'Anesthésiologie, Strasbourg Cedex, France

Background: Surgical teaching is most often carried out in the operating theatre through mentorship and the performance of surgical procedures is rarely measured.
The objective of this article is to compare the progression in learning curves of junior surgeons trained in the anterior plating technique for the distal radius on a non-biological model according to three different methods.
Methods: The materials comprised 12 junior surgeons of level 1 or 2 (as per Tang and Giddins) divided into three groups: control (G1), naive practice (G2) and deliberate practice (G3).
The three groups watched a demonstration video of a level 5 expert. The four G1 surgeons (two level 1 and two level 2) saw the video only once and each inserted five plates. The four G2 surgeons (two level 1 and two level 2) inserted five plates and watched the video before each time. The four G3 surgeons (two level 1 and two level 2) saw the video before the first plate insertion. Before posing the subsequent four plates, the four G3 surgeons watched their own video and the expert indicated their errors and how to avoid them next time.
A 12-criteria OSATS defined on the basis of the 60 videos, each graded from 1 (min.) to 5 (max.) was used to measure the objective surgical performance per plating (min. 12; max. 60) and per series of five plate fixations (min. 60, max. 300)
Results: The total average objective performance of G1 was 44.73, of G2 was 50.57 and of G3 was 54.35. Change in objective performance was better for G3 (13.25) than G2 (5) or G1 (3.75). For all groups, the progression in objective performance was better amongst Level 1 surgeons (9) than Level 2 surgeons (5.6).
Conclusion: Surgical teaching is based on mentorship and experience. However, since "see one, practice many, do one" has started to replace "see one, do one, teach one", learning techniques have increasingly relied on procedure simulators. Against this background, few studies have looked at measuring performance of surgical procedures and improved learning

curves. Our results appear to suggest that deliberate practice, when used in addition to mentorship, is the best option for shortening the growth phase of the learning curve and improving performance.
The results of this study need to be confirmed by a next study using the same OSATS, the same video and the same groups of surgeons by simply changing the synthetic radius models in a first step by anatomical subjects' wrists and then in a second step by surgeries performed in the operating room under the observation of their mentors.
Deliberate practice is a learning technique for surgical procedures that is complementary to mentorship and experience which it allows the growth phase of the learning curve to be shortened and the objective performance of junior surgeons to be improved.

A-0184 EFFICACY OF GABAPENTINOIDS ON PAIN INTENSITY AND SLEEP AFTER SUSPECTED TRAUMATIC NERVE INJURY: A SYSTEMATIC REVIEW AND META- ANALYSIS

Ebubechi K Adindu[1], Nienke A Krijnen[2,3], Sierra N Short[4], Teun Teunis[2]
[1]The University of Texas at Austin, Austin, TX, USA; [2]University of Pittsburgh Medical Center, Pittsburgh, PA, USA; [3]University Medical Center Utrecht, Utrecht, Netherlands; [4]Lake Erie College of Osteopathic Medicine, Greensburg, PA, USA

Purpose: Gabapentinoids are increasingly prescribed off-label to reduce suspected peripheral nerve injury related pain intensity. However, it's unclear if gabapentenoids outperform placebo, while side-effects are common, and misuse is increasing. Therefore, we reviewed the literature and asked: (1) do gabapentinoids reduce pain intensity more than placebo after suspected peripheral nerve injury? (2) is there a difference in sleep disruption?
Methods: We searched PubMed, EMBASE, and Cochrane Library for randomized controlled trials, or non-randomized prospective or retrospective comparative studies from Jan 2000 up to Jan 2022. Only studies reporting on suspected traumatic nerve injuries, measuring pain intensity with a visual analog or numerical rating scale were included. We found no non-randomized studies. Four placebo controlled randomized studies matched our inclusion criteria, including a total of 919 patients: 402 patients were treated with gabapentinoids, 394 with placebo, and 123 with both in two crossover trials. These crossover trials were at high risk of unblinding, which we addressed by excluding the after crossover (unblinded) results
Results: Gabapentinoids showed no significant difference in pain reduction compared to placebo at 1 month (-0.21, 95% CI [-0.72 to 0.29], p=0.40) and 2-4 months (-0.38, 95% CI [-0.76 to 0.00], p=0.05) after treatment. Similarly, their effect on sleep interference was minimal and likely not clinically relevant.
Conclusion: Gabapentinoids for suspected nerve injury are difficult to justify due to their lack of efficacy compared to placebo in reducing pain intensity and sleep disruption, particularly against the backdrop of substantial side-effects and potential for misuse.
Keywords: Peripheral Nerve Injuries; Pain Measurement; Pain; Trauma, Nervous System; Sleep; Humans; Off-Label Use; Systematic Review; Meta-analysis

A-0185 GUNSHOT-RELATED DISTAL RADIUS FRACTURES: A SINGLE-CENTER EXPERIENCE IN MANAGEMENT AND OUTCOMES

Kanad Ghosh[1], Manish Pathuri[1], Jason A Strelzow[2], Jennifer Moriatis Wolf[1]
[1]The University of Chicago Medicine, Chicago, USA; [2]Washington University in St Louis, St. Louis, USA

Introduction: Gunshot wounds (GSWs) to the upper extremities can be devastating and often require surgical treatment. Ballistic injuries to the distal radius in particular present a complex challenge for hand surgeons due to concerns of bony comminution, neurovascular injury, and injury to surrounding structures. This study compares the demographics, management, and complications of non-ballistic versus ballistic distal radius fractures (DRFs).

Methods: In this retrospective study, patients over the age of 16 years with radiographically confirmed DRFs were reviewed from 2018 to 2023. Demographic data, surgical details, and post-operative complication data was collected. Radiographical Union Score for Tibia (RUST) scores were calculated based on X-ray imaging for evaluation of fracture healing. In addition to comparison of all patients, 1:1 matched cohort comparison was conducted, controlling for age, smoking, and fracture classification

Results: Of the 265 patients, 21 had DRFs due to GSWs, and 244 had DRFs from other mechanisms. GSW patients were significantly younger and predominantly male. AO classification demonstrated higher intra- and extra-articular comminution in GSW patients and GSW patients had higher incidences of DRUJ instability and carpal fractures. Additional injuries outside the upper extremity and neurovascular symptoms were also more common in GSW patients. GSW patients were more likely to undergo surgery and had longer times to surgery. Despite the delayed surgical intervention, no significant differences were observed in fixation methods, time to full weight-bearing, or complications between groups. Radiographical healing evaluated by the RUST scoring showed GSW injuries had significantly higher scores, indicating higher degree of radiographic bone healing, between the 6-12 week and 12-18 week timepoints.

After 1:1 matching, there remained a significantly higher proportion of males in the GSW cohort, a higher rate of carpal fractures, a higher rate of non-hand injuries, and a greater time to surgery in the GSW cohort. RUST scores were no longer higher in the GSW cohort at the 6-12 weeks but remained higher between 12-18 weeks. There remained no significant difference in complications.

Discussion: Because of their intricacy, GSWs to the upper extremities provide considerable management issues. The present study compares ballistic to non-ballistic injuries to the distal radius and, while there were differences in presentation and surgical management, there were no significant differences in complications.

A-0186 BRIDGE PLATING FOR PERI-ARTICULAR FRACTURES OF THE HAND

Hussein Abdulrassoul[1], Cristina Graphia[1], Jeffrey Stepan[1], Jason A Strelzow[2], Jennifer Moriatis Wolf[1]
[1]The University of Chicago Medicine, Chicago, USA; [2]Washington University in St Louis, St Louis, USA

Background: Highly comminuted periarticular hand fractures about the MCP and PIP joints pose a particularly difficult challenge in fixation. This case series explores the adapted use of dorsal spanning bridge plating as a salvage option for severe and complex periarticular hand fractures.

Methods: Using an internal database we documented all cases of f periarticular hand fractures treated with dorsal spanning bridge plates. A retrospective analysis of medical records evaluated initial fractures, soft tissue injuries, short-term outcomes, and complications

Results: Over two years, we identified eleven patients with follow-up data who underwent dorsal spanning bridge plating for complex MCP and PIP joint fractures. Despite the severe injuries, 91% achieved bone union and, importantly, patients reported substantial pain relief, with an average pain score of 1.4/10 at final follow-up. Notably, 71% of patients had concurrent tendon or neurovascular injuries. As anticipated due to the nature of the injuries, postoperative stiffness was observed in all cases.
Conclusion: We present a novel form of fixation, adapted from the use of distal radial bridge plating, for severely injured MCP and PIP joints to provide ligamentotaxis and stability to allow healing. Despite the development of expected joint stiffness, the majority went on to healing. Our initial findings suggest that this technique holds promise in the treatment of these difficult injuries.

A-0187 EFFICIENCY OF AUTOLOGOUS BONE AND BONE SUBSTITUTES COMBINED WITH PLATELET-RICH FIBRIN IN THE RECONSTRUCTION OF POST-TRAUMATIC AND POST-EXCISIONAL TUMOR BONE DEFECTS OF THE HAND

Alexandru Amarandei[1], Stefana Luca[1,2], Malek Benmor[1], Dan Cristian Moraru[1,2], Mihaela Pertea[1,2]
[1]Department of Plastic Surgery and Reconstructive Microsurgery, Emergency County Hospital Iasi, Romania; [2]Grigore T Popa University of Medicine and Pharmacy Iasi, Romania

Background: Hand injuries from trauma and tumor resections often result in bone defects requiring reconstruction for functional and aesthetic recovery. Techniques for reconstructing these defects have expanded to include autologous bone grafts, synthetic bone substitutes, and emerging options such as platelet-rich fibrin (PRF), each chosen based on the injury's complexity and patient-specific factors. This study aims to evaluate the effectiveness of autologous bone grafts, synthetic bone substitutes, and PRF in reconstructing hand bone defects due to trauma or benign tumor excisions. We examined functional outcomes, patient satisfaction, and radiological assessments to determine the efficacy of each technique.
Methods: A retrospective study was conducted with 35 patients treated for metacarpal and phalangeal bone defects from trauma or enchondroma excision between 2022 and 2023. Reconstruction was performed using autologous bone (from "bank fingers" or the distal radius), synthetic bone substitutes and PRF in selected cases. Osteosynthesis materials were used for stabilization when necessary (K-wires or plates). Patient outcomes were tracked over a minimum of one year using DASH and ROM scores, VAS for pain, and radiographic evaluation for bone resorption /regeneration
Results: In a cohort of 41 patients, 29 were diagnosed with post-traumatic bone defects, and 12 with bone defects following enchondroma excision. For the treatment of post-traumatic bone defects, autologous bone grafts harvested from the distal radius or from a donor site were used in 20 cases, while bone substitutes were applied in the remaining cases—solid bone substitutes in 6 cases and liquid substitutes in 3 cases, with the addition of platelet-rich fibrin (PRF). For the reconstruction of defects following tumor excision, autologous bone grafts were used in 7 cases, solid bone substitutes alone in 3 cases, and a combination of autologous bone, bone substitute, and asociated with PRF in 2 cases. Radiological assessments confirmed effective bone regeneration, with no significant resorption (in cases with autologous grafts reconstruction). The functional and aesthetic outcomes, as well as patient satisfaction, assessed using the specified scales, were very good in all cases.
Conclusion: Autologous bone grafting remains the gold standard for reconstructing hand bone defects due to its osteogenic benefits. Bone substitutes, especially hydroxyapatite and tricalcium phosphate, are promising alternatives for less invasive options and to avoid morbidity in the bone donor site. The use of PRF offers an additional benefit for stimulating bone and soft tissue healing, further supporting functional outcomes in complex cases.

A-0188 A COMPARATIVE STUDY OF TYING METHODS IN TENDON REPAIR USING LOOPED SUTURES

Hideyuki Ota
Nagoya Ekisaikai Hospital, Nagoya, Japan

Introduction: A robust suturing technique is crucial for enabling early active motion therapy following flexor tendon repair, as early mobilization is vital for restoring function and preventing adhesions. Various suturing methods have been developed to enhance the strength of tendon repairs, with looped sutures becoming a popular choice for increasing repair stability. However, no studies have yet compared the strength of tendon repairs using looped sutures tied in two distinct ways: tying both threads together in a single knot versus tying each thread separately in two individual knots after removing the needle. This study aimed to compare the strengths of these two tying techniques within the 8-strand tendon repair method currently employed at our institution.

Methods: Sixteen fresh pig limb tendons were sharply transected and allocated into two groups: Group A (threads tied together in a single knot) and Group B (threads tied separately in two individual knots). Core sutures were placed using 4-0 looped sutures in an eight-strand, cross-locked cruciate repair configuration. No epitendinous sutures were used. The tendons underwent tensile testing, measuring the load required to produce 1-mm, 2-mm, and 3-mm gaps, as well as the ultimate tensile strength

Results: The average load required to produce a 1-mm gap was 12.4N for Group A and 6.8N for Group B ($P < 0.05$). For a 2-mm gap, the average load was 20.4N for Group A and 10.3N for Group B ($P < 0.05$). For a 3-mm gap, the average load was 28.0N for Group A and 17.0N for Group B ($P < 0.05$). The average ultimate tensile strength was 100.1N for Group A and 91.1N for Group B, with no statistically significant difference ($P = 0.175$).

Discussion: The Eight-strand Cross-locked Cruciate repair technique demonstrated strong tensile strengths for both tying methods, with ultimate tensile strengths exceeding 90N. This result suggests that both methods offer substantial biomechanical integrity compared to other tendon repair techniques. While no significant difference was observed in ultimate tensile strength, Group A showed significantly higher load-to-gap forces at all stages. The lower initial gap resistance in Group B may be attributed to uneven load distribution when tying threads individually. In contrast, although Group A's combined tying technique theoretically risks loosening, it still achieves sufficient ultimate tensile strength. These findings suggest that the tying method used in Group A may help lower the risk of postoperative tendon failure and enhance safety during early rehabilitation.

A-0189 DO SURGEONS TREAT THEIR PATIENTS' UPPER EXTREMITY NERVE PALSIES, LIKE THEY WOULD TREAT THEIR OWN?

Nienke A Krijnen[1,2], Jose Antonio Arellano[1], Kitty Y Wu[3], David Ring[4], Teun Teunis[1]
[1]University of Pittsburgh Medical Center, Pittsburgh, PA, USA; [2]University Medical Center Utrecht, Utrecht, Netherlands; [3]Mayo Clinic, Rochester, MN, USA; [4]the University of Texas at Austin, Austin, TX, USA

Purpose: Upper extremity motor neuropathies can recover for up to two years. Early surgical intervention in motor neuropathies with a high probability of an intact nerve (a nerve palsy) and a high probability of natural recovery risks unnecessary surgery. Understanding the variables influencing surgeons to offer intended disease-modifying or reconstructive surgery for nerve palsies might provide insight into variations in surgeon beliefs and guide recommendations to ensure that treatment choices align with what matters most to patients. We asked: (1) is there a difference in the likelihood of offering surgery for nerve palsy to a patient compared to choosing surgery for oneself?, (2) is there a difference

in the type of surgery offered?, and (3) what variables are associated with the likelihood of offering surgery?
Methods: Sixty-nine surgeons of the Science of Variation Group (SOVG) participated in a survey consisting of nine different nerve palsy scenarios; six traumatic and three non-traumatic. Duration of symptoms varied per scenario between 3 and 9 months (traumatic) or 9 and 15 months (non-traumatic). Participants were asked what their preferred treatment was and how likely they were to offer surgery at that time on a scale from 0 (not at all) to 10 (highly likely). Participants were randomized to choose for themselves (n=31) or for a patient of their age and gender (n=38). Surgeons were predominantly men (87%) and practiced in North America or Europe (88%)
Results: Although there was notable variation in offers of surgery, there was no difference in the overall likelihood of offering surgery to patients compared to oneself (4.3 [IQR 3.0 to 6.2] vs 4.8 [IQR 2.6 to 6.0]; p=0.95). There was no difference in the types of treatment offered for others compared to oneself. Women surgeons were less likely to recommend surgery (beta coefficient [b] -1.7, 95% CI -3.1 to -0.25; p=0.022), and surgeons practicing outside North America and Europe were more likely to recommend surgery (b 2.3, 95% CI 0.76 to 3.8; p=0.004). Surgeons were least likely to recommend surgery for idiopathic palsies and most likely for ulnar or radial nerve palsy following closed distal radius or humerus fracture. A longer duration of symptoms increased the likelihood of offering surgery.
Conclusion: Surgeons were moderately likely to recommend surgery for nerve palsies with notable variation in opinions regardless of whether they were deciding for themselves or for patients. Balancing the awareness of the documented benign natural history of specific nerve palsies with the pressure to act and the sense that recovery is "taking too long" might limit the rate of unnecessary surgery.
Keywords: Upper Extremity; Peripheral Nerves; Peripheral Nerve Injuries; Decision Making; Paralysis; Surgeons; Upper Extremity Nerve Palsies; Treatment Preferences; Variation in Treatment.

A-0190 RADIAL NERVE RECOVERY AFTER HUMERUS FRACTURE USING FREQUENTIST AND BAYESIAN STATISTICS

Nienke A Krijnen[1,2], Alexander Comerci[1], Linden K. Head[3], Ingmar W. F. Legerstee[4,5], Huub H. de Klerk[5], Neal Chen[5], Teun Teunis[1]

[1]Department of Plastic Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA; [2]Department of Plastic and Reconstructive Surgery, University Medical Center Utrecht, Utrecht, the Netherlands; [3]Division of Plastic and Reconstructive Surgery, Department of Surgery, University of Ottawa, Ottawa, Ontario, Canada; [4]Department of Plastic, Reconstructive and Hand Surgery, Erasmus University Medical Center, Rotterdam, the Netherlands; [5]Hand and Upper Extremity Service, Department of Orthopedic Surgery, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

Purpose: Humerus fractures are among the most common fractures and are accompanied by radial nerve injury in approximately 1 in 8 patients. Nerve transfers have gained popularity as a treatment option when spontaneous recovery does not occur, but they need to be performed early and therefore carry the risk of overtreatment since most radial nerve injuries are likely to recover spontaneously. The optimal timing of surgery - the moment the probability of neurotmesis outweighs the iatrogenic harm from surgery - is unclear. We asked: (1) What is the probability of recovery of radial nerve paralysis after humerus fracture accounting for time passed after injury? (2) What factors are independently associated with timing of radial nerve recovery?
Methods: We retrospectively re-screened records from a previously established patient cohort of 374 adults with surgically treated humerus fractures for patients with a radial nerve palsy. We included 53 patients with a radial nerve palsy in addition to their traumatic humerus fracture. The median age was 43 years (range 18 to 94), and 49% were male. Most palsies were present preoperatively (83%) and median time from injury to surgery was 2 days (range 0 to 64). We collected data on motor recovery (Medical Research Council 3 or higher) of the wrist and digits

Results: (1) Although the Kaplan-Meier function shows that after 4 months more than 50% of patients recovered motor function, the probability that a patient is going to recover, assessed with Bayesian statistics, remains above 50% up to 8 months. If a patient has not yet recovered, the probability that a patient is still going to recover is 45% at 8 months, 29% at 10 months, and 17% at 12 months. (2) Obese patients have a higher rate of recovery at any given time (HR 5.7, [95% CI 2.2 to 15]; $p<0.0001$).

Conclusion: Early exploration or nerve transfers for radial nerve injury after humerus fractures seem to carry a significant risk of overtreatment, as patients still have a substantial chance of spontaneous recovery at that time. Awaiting recovery for at least one year and performing tendon transfers seems to result in the lowest amount of overtreatment and unnecessary iatrogenic harm.

A-0191 RECOVERY TRAJECTORY OF BRACHIAL PLEXUS PALSY AFTER CERVICAL SPINAL SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

Alexander J. Comerci[1], Christopher J. Fedor[1], Hamid Alahmari[1], Nienke A. Krijnen[2,3], Teun Teunis[2]

[1]University of Pittsburgh, Pittsburgh, PA, USA; [2]University of Pittsburgh Medical Center, Pittsburgh, PA, USA; [3]University Medical Center Utrecht, Utrecht, Netherlands

Purpose: Brachial plexus (BP) neuropathy is a potential complication following cervical spinal surgery. Some propose nerve transfers to treat subsequent deficits. Since nerve transfers work best within one year after injury, the decision to proceed with surgery must be made relatively quickly after onset of the palsy. As recovery has occurred up to 41 months after cervical surgery however, surgical management within one year of injury may result in over-treatment. We therefore asked: what is the likelihood of recovery at various intervals after injury?

Methods: A systematic review and meta-analysis of individual patient data was reported according to PRISMA guidelines. The primary outcome was probability of recovery (Manual Muscle Testing score of 3 or greater) of the affected myotome by 24 months. From 2581 articles, 20 studies were selected for analysis. In total, 74 BP palsy patients were included with a median age of 63.5 (IQR 16) years. Median follow-up was 12 (IQR 16) months. Results: Overall, 62 patients (83.8%) recovered. Specifically, 8.1% of patients recovered within one month, while 24.3%, 47.3%, 48.7%, and 60.8% recovered within three, six, nine, and 12 months, respectively. Patient sex and age were not associated with recovery ($p=1.000$, $p=0.361$). Procedure type and MMT score at neuropathy onset, however, were associated with recovery (both $p<0.001$). MMT score at onset was also associated with time to recovery ($p<0.001$). Higher MMT score at onset was associated with a significant increase in odds of recovery (OR: 3.14; 95% CI: 1.52, 6.48; $p=0.002$).

Conclusion: Natural recovery for BP palsy is common with most palsies resolving by two years. At 6 months, about 2/3 of the patients will still recover, resulting in a number needed to harm of 1.5 if one decides to perform nerve transfers at this time. Surgeons and patients have to decide if this risk of harm is acceptable to them. Awaiting recovery for 2 years and performing tendon transfers at this time seems to result in the lowest amount of overtreatment and unnecessary iatrogenic harm.

A-0193 COMPLICATION RATES BETWEEN INTRA-MEDULLARY AND OTHER FIXATION METHODS FOR EXTRA-ARTICULAR METACARPAL AND PHALANGEAL FRACTURES

Ishan Patel[1], Nienke A. Krijnen[2], Nicky Don[3], Teun Teunis[2]
[1]Albany Medical College, Albany, NY, USA; [2]University of Pittsburgh Medical Center, Pittsburgh, PA, USA; [3]University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

Purpose: Phalangeal and metacarpal fractures are the second and third most common upper extremity fractures. Intramedullary screw (IM nail) fixation is an increasingly used method for fracture fixation of the hand, providing potential benefits of early mobilization and improved functional recovery. The aim of this study is to compare adverse event rates between IM nail fixation, K-wires, and plate or screw fixation for extra-articular fractures of the hand.
Methods: A retrospective chart review was conducted at a tertiary care center of all adults surgically treated for extra-articular phalangeal and metacarpal fractures between January 2012 and December 2023. All IM nails and plate or screw fixations were included. IM nail patients were matched 1:3 with K-wire patients randomly based on age and sex for the final patient cohort. Patient charts were reviewed for demographics, mechanism of injury, injury fixation method, overall adverse events, graded adverse events (Clavien Dindo classification), infection treated with antibiotics, and re-operation. Baseline differences were assessed using chi-squared tests and one-way ANOVA. Overall adverse events, infections treated with antibiotics, and re-operations were analyzed between the fixation methods using multivariable analysis, accounting for baseline differences
Results: A total of 368 patients with 485 total repairs were identified for analysis. Mean age was 41 (range 18 to 88) and majority of patients were male (70%). Overall, there were 103 fractures repaired with IM nail fixation, 282 fractures repaired with K-wires, and 100 fractures repaired with plate or screw fixation. Fractures that were repaired with IM nails were less likely to experience an overall adverse event (OR 0.47 [95% CI 0.33 to 0.56, $p=0.023$]) or require re-operation (OR 0.17 [95% CI 0.070 to 0.42, $p<0.001$]) compared to K-wires and plates and screws. Fractures that were repaired using plates and screws had a lower rate of infection (OR 0.27 [95% CI 0.10 to 0.74, $p=0.009$]) compared to K-wires. Re-operation was more likely in patients with four ($p<0.001$) or five ($p=0.042$) total fractures as compared to patients with one fracture. Concurrent neurovascular injury was an independent risk factor for overall adverse events, infection, or re-operation ($p<0.05$).
Conclusion: Our results support the increasing use of IM nail fixation. Further study is required to establish potential differences in long-term functional outcomes.

A-0194 A COHORT STUDY OF SHORT-TERM FUNCTIONAL OUTCOMES OF PROXIMAL INTERPHALANGEAL JOINT METAL ON POLYETHYLENE SURFACE REPLACEMENT ARTHROPLASTY

Rahul Kakkar, Nawaz Vahora
University Hospitals of Morecambe Bay Trust,United Kingdom

Purpose: The purpose of this study was to evaluate the short term functional outcomes of proximal interphalangeal (PIP) joint surface replacement arthroplasty using the Capflex prosthesis (KLS-Martin).The study aimed to assess improvements in pain levels and any improvement in range of motion (ROM) postoperatively as well as to identify any complications associated with the procedure. It also aims to provide any technical difficulties and learning tips through the study.
Methods: This retrospective cohort study included 18 Proximal interphalangeal joint metal on polyethylene replacement carried out in 15 patients (10 females, 5 males) aged 51 to 75 years. Preoperative and postoperative pain levels were assessed using the Visual Analog Scale (VAS) and also based on subjective analysis if patient would have it done in other

Proximal interphalangeal joints of their fingers. ROM was measured using a goniometer. Statistical analysis, including paired t-tests and 95% confidence intervals, was performed to determine the significance of changes in pain scores and ROM. Complications including revision surgery were documented

Results: VAS scores also showed improvement, decreasing from an average of 7 preoperatively to 1.44 postoperatively. The average preoperative ROM was 39.44°, which improved to an average postoperative ROM of 48.89°, indicating a statistically significant increase ($p < 0.05$) in our observation. Complications occurred in two cases, with one patient requiring revision surgery. The overall complication and revision rates were within acceptable ranges

Conclusions: Capflex PIP joint arthroplasty reduces pain levels in patients with PIP joint disorders and subjective analysis does show patients willingness for the procedures in other PIP joints of fingers. In our observation, study also showed improvement in range of movement. Postoperative monitoring and preoperative patient selection are crucial, especially in older populations, to minimize the risk of complications such as stiffness or loosening. The surgical learning curve is however steep.

Clinical Relevance: The Capflex prosthesis offers a viable option for proximal interphalangeal joint surface replacement, providing reduced pain post-surgery and possible improved mobility.

Level of Evidence: Level IV (Retrospective case series).

Keywords: Proximal interphalangeal joint, Capflex arthroplasty, range of motion, pain management, prosthesis complications.

A-0195 EFFECTS OF STATIN TREATMENT ON THE DEVELOPMENT OF TENDINOPATHY ACCORDING TO THE TYPE AND CUMULATIVE DOSES OF STATINS: A NATIONWIDE POPULATION–BASED COHORT STUDY

Donghee Kwak[1], Seok-joo Moon[2], Jong Woong Park[1], Duk Hee Lee[3], Jung Il Lee[4]

[1]Department of Orthopedic Surgery, Korea University Anam Hospital, Seoul, South Korea; [2]Smart Healthcare Center, Korea University Guro Hospital, Seoul, South Korea; [3]Department of Emergency Medicine, Ewha Woman's University Mokdong Hospital, Seoul, South Korea; [4]Department of Orthopedic Surgery, Korea University Guro Hospital, Seoul, South Korea

Background: Previous longitudinal cohort studies reported the conflicting results of the relationship between statin use and the development of tendinopathy disorder. It is also unclear if there is a relationship between statin use, particularly the type or cumulative doses, and the development of tendinopathy disorder. This study aimed to investigate an association between statin treatment and the development of tendinopathy.

Methods: A total of 594,130 participants were entered in 2002 and followed up until 2015. There were 84,102 of statin users and 168,204 controls (statin non-users) were selected at a ratio of 1:2 using propensity score–matching analysis. The types of included tendinopathy were as follows: (1) trigger finger, (2) radial styloid tenosynovitis, (3) elbow epicondylitis, (4) rotator cuff tendinopathy, and (5) Achilles tendinitis. Cox proportional hazards models with time-varying covariates were constructed to identify the association between statin use and tendinopathy development

Results: Statin treatments regardless of statin types was associated with a significantly greater risk of all types of tendinopathy development (hazard ratio [HR], 1.435; 95% confidence interval [CI], 1.411–1.460) compared to no statin treatment. A trend toward risk reduction was observed according to cumulative statin doses, which was indicated by HR of 2.337 (95% CI, 2.269–2.406), 2.210 (95% CI, 2.132–2.290) and 1.1 (95% CI, 1.098–1.146) in patients with a cumulative defined daily dose of 90, 91-180, and >180, respectively.

Conclusion: This nationwide population–based cohort study suggests that statin use regardless of the statin type was associated with greater risk of tendinopathy compared to statin non-user. The risk of tendinopathy development was diluted with the increasing cumulative defined daily dose.

A-0196 OPPONENSPLASTY USING THE EXTENDED EXTENSOR INDICIS PROPRIUS TENDON FOR CARPAL TUNNEL SYNDROME IN SEVEN PATIENTS

Hideaki Miyamoto, Takahiro Sasaki, Toshimitsu Sato, Kensuke Ikuta, Hirotaka Kawano
Teikyo University Hospital, Tokyo, Japan

Background: Opponensplasty for carpal tunnel syndrome (CTS) encompasses various techniques. We have refined the Burkhalter procedure, which involves transferring the extensor indicis proprius (EIP) tendon from the ulnar side of the wrist and attaching it to the abductor pollicis brevis muscle tendon. In our modification, we extend the EIP tendon and suture it to the dorsal ulnar side of the thumb metacarpal bone. This study aims to evaluate the outcomes of modified Burkhalter opponensplasty using the extended EIP tendon for CTS.

Materials and Methods: We performed this procedure on severe CTS patients who did not exhibit compound muscle action potential from the abductor pollicis brevis muscle in the nerve conduction velocity test. This study included seven patients who underwent this surgery and were followed up for more than six months postoperatively. We investigated the sex, age at the time of the operation, the extended length of the EIP tendon during the operation, the presence of ulnar nerve symptoms before and after surgery, and the opponent function of the thumb before and six months after surgery. The primary outcomes were the range of palmar abduction of the thumb, the distance between the tip of the thumb nail and the radial edge of the flexion crease of the index finger's proximal interphalangeal joint, the nail tip angle, and the Kapandji index score. The Wilcoxon signed-rank test was used to evaluate pre- versus post-operative measurements. A p-value of <0.05 was considered significant

Results: The study included one man and six women, with an average age of 71 years at the time of surgery. No cases reported ulnar nerve symptoms. The average extended length of the EIP tendon was 36 mm during the operation. The range of palmar abduction of the thumb improved from 42° to 49° ($P = 0.015$). The distance between the tip of the thumb nail and the radial edge of the flexion crease of the index finger's proximal interphalangeal joint improved from 85 mm to 94 mm ($P = 0.011$). The nail tip angle improved from 112° to 132° ($P = 0.035$). The Kapandji index score improved from 6.3 to 8.1 ($P = 0.015$).

Discussion: The conventional Burkhalter procedure can repair the thumb by pulling it in an anatomic vector from the ulnar side, in contrast to the Camitz procedure. However, the donor EIP tendon is often too short to be attached to the thumb, resulting in tightened thumb adduction and compression of the ulnar nerve. Our procedure, which involves transferring an extended EIP tendon, allowed for a more distal and ulnar insertion on the thumb metacarpal bone and improved thumb opponent function.

A-0197 IDEAL POSITIONING OF THE C-GUIDE FOR CREATING AN OPTIMAL BONE TUNNEL IN ARTHROSCOPIC ONE-BONE TUNNEL TRANSOSSEOUS TFCC FOVEAL REPAIR

Jae Jun Nam, Yeongyoon Koh, In Cheul Choi, Jong Woong Park
Korea University Anam Hospital, Seoul, Korea

Purpose: This study aims to determine the ideal positioning of the C-guide for creating an optimal bone tunnel at the anatomical triangular fibrocartilage complex (TFCC) foveal insertion site during arthroscopic one-bone tunnel transosseous TFCC foveal repair.

Materials and Methods: A total of 60 patients who underwent arthroscopic one-bone tunnel transosseous suture repair for Palmer 1B foveal TFCC tears (with or without superficial fiber tears; Atzei class 2 [$n = 30$] or class 3 [$n = 30$]) from October, 2017 to October, 2023 were selected. Immediate post-operative plain radiograms taken the day of the surgery

were used to measure the starting point of the bone tunnel, the length of the bone tunnel, and the angle relative to the longitudinal axis of the ulnar shaft. Based on these measurements, the ideal intraarticular positioning of the C-guide tip over the TFCC was estimated on coronal and axial slices from preoperative MRI scans

Results: The mean starting point of the C-guide was 12 mm (range: 10.2–12.7 mm) proximal to the tip of the ulnar styloid process, corresponding to the proximal end of the convex curvature on the lateral side of the ulnar styloid process. The average length of the bone tunnel was 10.0 mm (range: 9.2–13.0 mm). The bone tunnel angle relative to the ulnar shaft averaged 37 degrees (range: 30.2–40.6 degrees), targeting the anatomical center of the foveal insertion site. Based on this angle and starting point, the C-guide's endpoint over the TFCC on coronal MRI was approximately 4.0 mm (range: 3.4–4.6 mm), and on axial MRI was 4.0 mm (range: 3.5–4.6 mm), radial to the medial border of the ulnar styloid process. The distance from the line connecting the volar and dorsal corners of the radius to the medial side of the ulnar styloid on coronal and axial MRIs averaged 12.3 mm (range: 11.2–12.9 mm) and 12.7 mm (range: 12.1–13.2 mm), respectively. Based on these measurements, under arthroscopic view, the C-guide tip could be positioned at the center of the upper third of an imaginary line dividing a triangle formed by connecting the dorsal and volar corners of the radius and the center of the ulnar styloid process.

Conclusion: The ideal starting point for the bone tunnel is approximately 12 mm from the ulnar styloid tip, with an average tunnel length of 10.0 mm. The optimal C-guide angle is around 37 degrees. Under arthroscopy, the C-guide tip can be positioned at the center of the upper third of an imaginary line dividing a triangle formed by connecting the dorsal and volar corners of the radius and the ulnar styloid process.

A-0198 RADIOGRAPHIC AND CLINICAL OUTCOMES OF ULNAR SHORTENING OSTEOTOMY ALONE VERSUS ULNAR SHORTENING OSTEOTOMY WITH TFCC FOVEAL REPAIR IN PATIENTS WITH ULNAR IMPACTION SYNDROME COMBINED WITH TFCC FOVEAL TEAR

Ma. Loren Josephine Lantin[1,2], Yeongyoon Koh[2], Jae Jun Nam[2], In Cheul Choi[2], Jong Woong Park[2]
[1]East Avenue Medical Center, Quezon City, Philippines; [2]Korea University Anam Hospital, Seoul, Korea

Purpose: This study compares radiographic and clinical outcomes of ulnar shortening osteotomy (USO) alone versus USO combined with arthroscopic transosseous triangular fibrocartilage complex (TFCC) foveal repair in patients with ulnar impaction syndrome (UIS) combined with TFCC foveal tears.

Materials and Methods: This retrospective study included 18 patients diagnosed with UIS, presenting with chondral lesions of the lunate on preoperative plain radiographs and concurrent TFCC foveal tears. The patients were divided into two groups: Group 1 (n = 9) underwent USO alone, while Group 2 (n = 9) underwent USO combined with arthroscopic transosseous TFCC foveal repair. Radiographic outcomes, including changes in the size of the chondral lesions and ulnar variance(UV), were evaluated preoperatively, immediately postoperatively, and at 6-month, 1-year, and 2-year follow-ups. Clinical outcomes were measured using the visual analogue scale (VAS), Quick Disabilities of the Arm, Shoulder, and Hand (Q-DASH) questionnaire, Mayo Wrist Scores, and Patient-Rated Wrist Evaluation (PRWE), assessed preoperatively and at 1-year and 2-year follow-ups

Results: In the radiographic results, both groups demonstrated progressive healing in the size of the chondral lesion after USO. Group 2 showed faster healing at 1 year postoperatively compared to Group 1(p=0.039). Both groups exhibited significant reductions in ulnar variance until 6 months postoperatively, but Group 1 showed increased positive ulnar variance at 2 years postoperatively(Gr 1;1.86mm), whereas Group 2 showed no significant changes in ulnar variance(Gr 2; 0.43mm) (p=0.045). Clinically, both groups achieved satisfactory recovery, with no statistically significant differences in

VAS, Q-DASH, Mayo Wrist scores, and PRWE at 1- and 2-year follow-ups. There was no significant statistical relationship between changes in chondral lesion size and ulnar variance with clinical outcomes.
Conclusion: Patients undergoing USO combined with arthroscopic transosseous TFCC foveal repair showed faster healing of chondral lesions and maintained corrected ulnar variance over 2 years of follow-up. Although both groups demonstrated clinical improvements, radiographic improvements in chondral lesions and ulnar variance did not directly correlate with clinical outcomes.

A-0199 GIANT LIPOMAS OF THE ARM

Adriana Martinez-Catasús, Nerea Martinez-Franco, Jordi Faig-Martí
Sant Rafael Hospital, Barcelona, Spain

Introduction: Lipomas are the most common benign mesenchymal tumor and are most commonly located subcutaneously but can occur in any tissue planes. Giant lipomas involving the upper extremities are rare and to be refferred as "giant", it should be at least 10 cm in diameter or weigh a mínimum of 1000g.
Materials and Methods: We report three patients who complained of discomfort, paresthesias and a mass in the arm for several years. On clinical examination, there was a soft mass of 11cm x 10, 15x3,4 and 12x6,6cm in each patient over the posterolateral aspect of the arm, not involving the skin. The MRI revealed a lobulated deep lipoma in the posterior compartiment of the arm, displacing muscular elements
Results: Patients were planned for excision of the lipoma and a straight postero-lateral approach was used to reach the mass. No neurovascular structure was involved but the radial nerve was in close proximity to the masses, so great care was taken intraoperatively to asses the relationship between the mass and this nerve. The masses were removed by dissection and sent for histopathological analysis which confirmed lipomas with no atypical features on microscopy
Conclusions: Giant lipomas of the upper extremities are rare and slow growing lesions. The definitive diagnosis of a lipoma can only be made histologically, but MRI remains the imaging modality of choice for their diagnosis. Ressection is associated with cure in most patients and it is important to be careful with close proximity to major neurovascular bundles.

A-0200 DELAYED HEALING WORSENS OUTCOMES IN FLEXOR TENDON REPAIR SURGERY

John Kiely, Fiona Reilly, Dan Thornton
Department of Plastic and Reconstructive Surgery, Leeds Teaching Hospitals NHS Trust, Leeds, UK

Aims: Flexor tendon injury in the hand is a common injury which is associated with significant morbidity for the patient, and the healthcare costs including prolonged outpatient care and potential further surgery for tendon rupture or adhesions. Despite this most literature focuses on repair rupture rather than functional outcomes, and these studies have largely been at registry level or in vitro models.
We aimed to establish whether delayed healing is a risk factor for poorer functional outcomes for patients undergoing repair of Zone 1/2 injuries.
Methods: A prospective database for patients treated by our department for flexor tendon injuries was analysed. Patient demographics, comorbidities, injury mechanism, surgical details and outpatient outcomes were recorded including total active movement (TAM) and repair rupture. Statistical analysis was performed with Jamovi 2.3.21.0 for descriptive statistics, binomial and linear regression

Results: 61 repaired flexor zone 1/2 injuries were identified between February 2023-24, 90% open, 82% single or both flexors divided. 5% had a repair rupture confirmed by surgical exploration or imaging.
Linear regression demonstrated a statistically significant negative relationship between days to healed wound and 6 week TAM (estimate -1.98 degrees/day p=0.02) and 12 week TAM (estimate -2.1 degrees/day p=0.009). No other statistically significant relationship was identified between TAM and other factors.
Binomial regression did not show a relationship between repair rupture and time to healing or other variables recorded
Conclusions: Time to healing was associated with poorer functional outcomes, and this likely reflects a range of wound and surgical factors. We advise careful consideration of wound exploration and extension to reduce the burden of healing on the injured digit to allow improved outcomes.

A-0201 USING RING-PINS FOR THE TREATMENT OF ULNAR STYLOID FRACTURES

Sotetsu Sakamoto, Yasunori Hattori, Jun Sasaki, Kota Hayashi, Ayumi Suzuki, Kazuteru Doi
Department of Orthopedic Surgery, Ogori Daiichi General Hospital,i, Yamaguchi, Japan

Introduction: Several surgical techniques have been reported for the treatment of displaced Ulnar styloid fractures (USFs), of which tension band wiring (TBW) is a widely accepted fixation technique. However, there is a risk of K-wire loosening and skin complications. The ring pin, which is a K-wire with an eyelet at the tail for the passage of a wire, was introduced for olecranon and patella fractures. It can be locked to the tension band and prevent pin migration. This report presents our experience with using a small ring pin for USFs.
Material and Methods: The ring pin has a diameter of 1.0 mm and a length of 40 mm. One or two ring pins were inserted into the tip of the styloid, depending on the fragment size. The ring pins were placed initially penetrating the cortical bone, and then advanced into the medullary cavity to avoid penetrating the opposite cortex. Fixation was achieved by wrapping a 0.5 mm steel wire or 3-0 fiberwire in a figure of eight through the eyelet of the previously inserted ring pins. Proximally, the steel wire or fiberwire was passed through a bone tunnel 10 mm proximal to the fracture site.
Ten consecutive patients with USFs associated with DRFs underwent osteosynthesis with ring pins between 2022 and 2023 and were followed for a minimum of 6 months. All DRFs were treated with volar plating. The indication for fixing USF was residual instability of the distal radioulnar joint after plating of DRFs. There were three males and seven females, with a median age of 67 years (IQR: 65, 69) at the time of the surgery. The number of ring pins was two in six patients and one in four patients, respectively. A 0.5 mm steel wire was used for fixation in eight patients and a 3-0 fiberwire in two patients
Results: No patients experienced pain or skin irritation from the pins. Wrist range of motion median values were 75° extension (IQR: 70, 80), 63° flexion (60, 70), 90° supination (90, 90), and 80° pronation (72.5, 80), with grip strength at 94% of the unaffected side (84, 99). The modified Mayo wrist score (MMWS) was 100 (92, 100) and the patient-rated wrist evaluation (PRWE) was 4 (0, 6). Bone union was achieved in all patients without pin loosening according to the latest radiographs. No complications were reported.
Discussion: Our experience found two benefits. The first advantage is the ability to prevent backing out of pins. The second advantage is the simplicity of the surgical procedure. Traditional TBW requires the tip of the K-wire to penetrate the opposite cortex for stability, but it can slip into the medullary canal and compromise fixation. On the contrary, ring pins do not require the pin tip to penetrate the opposite cortex. Using the ring pin can offers a safe and reliable alternative to traditional TBW.

A-0202 ACCURACY ASSESSMENT ULTRASOUND USE PREOPERATIVELY IN PRIMARY FLEXOR TENDON REPAIR: A SYSTEMATIC REVIEW

SS Seraj[2], R Faderani[1,2], P Shahrjerdi[3], G Kungwengwe[4], M Kanapathy[1,2], Nikkhah, D[1,2], A Mosahebi[1,2]
[1]Department of Plastic Surgery, Royal Free Hospital, London, United Kingdom; [2]Department of Surgery and Interventional Sciences, University College London, Royal Free Hospital, London, United Kingdom; [3]Department of Plastic Surgery, St Mary's Hospital, London, United Kingdom

Introduction: Flexor tendon injuries disrupt hand function and require precise surgical repair. Traditionally assessed through physical examination alone, ultrasound scanning (USS) is emerging as a valuable tool, offering real-time, non-invasive imaging to assess injury type and extent
Aim: This review aims to evaluate USS's accuracy in preoperative flexor tendon assessment
Material & Methods: Following PRISMA guidelines, a systematic review was conducted using MEDLINE, EMBASE, and Web of Science. Studies on primary flexor tendon injuries assessed with preoperative USS were included
Results: From 1,354 initial studies, nine met inclusion criteria, comprising one RCT, four prospective, and four retrospective studies. In total, 450 patients (593 tendons) with diverse injuries were assessed. USS sensitivity and specificity were high for complete tears (88.78% and 92.23%) but lower for partial tears (0.5% and 49%)
Conclusions: USS provides an effective, non-invasive method for identifying complete flexor tendon injuries, reducing the need for exploratory surgery, facilitating targeted incisions, and potentially shortening operative times. By enabling accurate surgical planning, USS helps minimise dissection and trauma, aligning with sustainable healthcare practices. Its application in delayed presentations also guides repair strategies, enhancing outcomes through more precise tendon localisation.

A-0203 INVESTIGATION OF THE EFFECT OF BODY POSITION ON PERFORMANCE IN HAND FUNCTION TESTS

Beril Sahin[1], Zeynep Tuna-Emir[2]
[1]Gazi University, Institute of Health Sciences, Department of Physiotherapy and Rehabilitation, Ankara, Turkey; [2]Gazi University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Ankara, Turkey

Introduction: Hand function tests are frequently used for clinic and research purposes. Although these tests are standardized, the manuals of most tests do not specify in which position the test should be performed. Since sitting and standing positions differ in terms of postural control, these two positions are thought to result in difference regarding the hand function performance
Aim: The aim of the study was to investigate whether sitting and standing positions affect the results of commonly used hand function tests.
Method: Healthy young adults were invited to the study. Individuals with a history of pain or injury in the upper extremity within the previous 6 months, loss of sensation and any limitation in the hand and upper extremity, and those who require support in sitting or standing were excluded. Grip and pinch strength (bipod, tripod and lateral) were measured in and Nine Hole Peg Test (NHPT), Minnesota Manual Dexterity Test (MMDT), and Jebsen-Taylor Hand Function Test (JTHFT) were performed in sitting and standing positions. All tests were performed only with the dominant hand, with a 1-week interval between the two positions and in a random order. The results in sitting and standing positions were compared
Results: The study was completed with 100 participants (mean age 22.9±2.5). Twelve participants had left hand dominance (12%). The results of grip ($p=0.114$) and pinch (bipod pinch, $p=0.384$; tripod pinch, $p=0.475$; lateral pinch, $p=0.329$, consecutively) strength besides NHPT ($p=0.559$) and total completion time of JTHFT ($p=0.244$) were similar between

two positions. In MMDT, the results of the turning subtest were not affected by the positional change (p=0.976), while the placing subtest showed better results in the standing position (p=0.002)
Conclusions: The results of this study showed that the results of grip and pinch strength, NHPT, JTHFT and the turning subtest of MMDT were similar in sitting and standing positions. The effect of position on results in the placing subtest of MMDT was believed to be due to the postural requirements of this test. As the test procedure requires to bend more to reach the equipment, a stable position could not be maintained during the test. The standing position was thought to be advantageous in this test, as it may be easier to reach the upper row of the test board when the body is in a bent position. It can be concluded that most tests are not affected by position changes and thus, a position where the patient is comfortable can be preferred. However, in cases where postural requirements such as bending and reaching are more, body position may have an effect on the test performance.

A-0204 OSTEOPHYTE GROWTH OVER 10 YEARS IN THE FINGERS OF HIGH-LEVEL CLIMBERS AND CONTRIBUTING FACTORS

Andreas Schweizer, Priska Schmid, Stefan Fröhlich, Torsten Pastor, Lisa Reissner
Universitätsspital Balgrist, Zürich, Switzerland

Although osteophytes in climbers' fingers are known as part of a mechano-adaption, there is still a lack of knowledge as for progression of osteophytes and contributing factors during an advanced elite climber's career. The purpose of this study was to analyze osteophyte growth over a period of 10 years for each phalangeal head and base of all proximal interphalangeal joints (PIP) and distal interphalangeal joints (DIP) (digits II-V on both hands) individually as well as the impact of potential climbing related influencing factors. Furthermore, the osteophytes located at the palmar aspect of the neck of the proximal phalanx (palmar neck osteophytes) were investigated as an entity on its own and joint space narrowing was evaluated and compared with osteophyte growth. Radiographs of 31 male elite climbers were analyzed in lateral view for osteophytes and in anterior-posterior (a.p.) view for joint space at baseline and 10-year follow-up. Even after more than two decades of elite climbing, osteophytes grew significantly at most phalangeal heads and bases. Joints that were already severely affected at baseline, specifically DIP Dig III and IV of both hands, had an especially high effect size (DIP base: Dig III left; 0.517, Dig III right; 0.355, Dig IV left; 0.519, Dig IV right; 0.555, DIP head: Dig III left; 0.348, Dig III right; 0.591, Dig IV left; 0.533, Dig IV right; 0.408). The extent of osteophytes at baseline is highly predictive for further development (79.3%); however, no climbing-related factors like climbing performance or climbing years were determinable for additional explanation. Palmar neck osteophytes are pathognomonic to climbing as they are most likely caused by the phalangeal base hitting this area repeatedly in an hyperflexed position. Furthermore, there is no correlation between osteophyte growth and joint space narrowing during an elite climber's career.

A-0205 AN EARLY COST-EFFECTIVENESS ANALYSIS PROVING COST-EFFECTIVENESS OF 3D GUIDED COMPARED TO 2D PLANNED CORRECTIVE OSTEOTOMIES OF THE RADIUS FROM A DUTCH SOCIETAL PERSPECTIVE

Camiel J. Smees[1,2], Quinty B. Teggeler[2], Judith olde Heuvel[1], Anne J.H. Vochteloo[1], Gabriëlle J.M. Tuijthof[2]
[1]OCON Centre for Orthopaedic Surgery, Hengelo, the Netherlands; [2]University of Twente, Enschede, the Netherlands

Introduction: Malunion is the most common complication of distal radius fractures, leading to wrist pain, functional impairment, and cosmetic deformity. Conventional treatment uses two-dimensional (2D) preoperative planning for

corrective osteotomy. However, planning a corrective osteotomy of the radius using 2D images can be challenging. 3D planning and patient-specific guides has shown promising effects on patient outcomes, but also increases costs. It is currently unknown whether the improved patient outcomes justify the increased costs

Aim: This study aimed to evaluate the balance between costs and benefits of 3D planning by conducting an early cost-effectiveness analysis of 3D-guided versus 2D-planned corrective osteotomy for distal radius malunion from a Dutch societal perspective

Material & Methods: A health state transition model was developed to evaluate the cost-effectiveness of 3D-guided versus 2D-planned corrective osteotomy. Outcomes of interest included quality-adjusted life-years (QALYs) gained, number of revisions in each strategy, and incremental cost-effectiveness ratio (ICER) per QALY gained. Model inputs were based on patient data from OCON and existing literature. These inputs included transition probabilities, costs, and utilities. Several scenario analyses were conducted, including one incorporating improved recovery for patients treated with the 3D strategy

Results: 3D-guided corrective osteotomy resulted in a slight increase in QALYs (0.004) and a reduction in costs (€72.36), indicating that the 3D approach was marginally cost-effective. At a willingness-to-pay threshold (WTP) of €20,000, the probability of 3D being cost-effective was 0.77. A scenario analysis incorporating improved recovery for patients treated with the 3D approach increased the incremental QALY to 0.085

Conclusions: Based on this early cost-effectiveness analysis from a Dutch societal perspective, 3D-guided corrective osteotomy is expected to be cost-effective compared to 2D-planned corrective osteotomy. While further research is needed to better validate the assumptions, such as revision rates and patient recovery, this initial analysis provides a sufficient basis to continue using 3D technology in clinical practice.

A-0206 A MODEL TO INTUITIVELY VIZUALIZE THE PULLEY GEOMETRY OF THE FLEXOR TENDON SHEATH

Andrea Hinteramskogler[1], Leonie Hoffmann[2], Joachim Ganser[3]

[1]University of Vienna, Austria; [2]Department of Plastic and Hand Surgery, University Hospital, Basel, Switzerland; [3]Department of Hand Surgery, Spital Buelach, Switzerland

Aim: Diseases and injuries of the hand regularly affect the function of its tendons. This function is determined by the geometry of the finger joints, the anatomy of the tendons and the biology of the tissues involved.

Although the number of moving and stabilizing structures and their mechanics are wellknown and have been well studied for many years, we hand surgeons often find it difficult to put this knowledge into practice.

For this reason, we would like to present our brief thoughts on the mechanics of the tendons and ligaments of the hand as simply as possible.

Material & Methods: We will use a lifelike model to illustrate the effects of pulley defects on the effective leverage and movement amplitude of the joints. At the same time, we attempt to explain geometrically why pulley venting as well as traumatic ruptures or transections, are often compensated for without loss of motion. The most common pulley injuries from A1 to A5 and their consequences are simulated

Results: With our model we can confirm the results published in the literature regarding bowstring phenomena and gliding amplitude of the flexor tendons with respect to certain and especially combinations of pulley defects

Conclusions: In this way, we hope to make a small contribution to simplifying everyday problems. On the one hand, the

direct visual representation makes it easier to understand the geometry, but on the other hand it also provides new ideas.

A-0207 SHORT VS LONG IMMOBILIZATION PERIOD FOR CONSERVATIVE TREATMENT OF DISTAL RADIUS FRACTURES IN THE ELDERLY: A RANDOMIZED CONTROLLED TRIAL

Aleix Sala Pujals[1], Judith Chillon Soria[1], Alba Portes Chiva[1], Albert Pardo Pol[1,2], Daniel Valverde Vilamala[1], Enric Dominguez Font[1]

[1]Hospital del Mar, Barcelona, Spain; [2]Hospital Universitari Dexeu, Barcelona, Spain

Introduction: Management of distal radius fractures (DRFs) in elderly patients remains controversial. While conservative treatment with cast immobilization is widely accepted, the optimal duration for immobilization is unclear

Aim: This study aimed to compare pain control, functional outcomes, and complication rates between 4-week and 6-week immobilization periods in elderly patients treated non-operatively for displaced DRFs

Material & Methods: A single-centre randomized controlled trial was conducted, including 150 patients aged over 65 with displaced DRFs. Patients were randomized into two groups: group I (4-week immobilization) and group II (6-week immobilization). Pain was assessed using the Visual Analogue Scale (VAS) at 10 days after removing the cast and 3, 6 and 12 months. Functional outcomes were measured using the Patient-Rated Wrist Evaluation (PRWE) and Quick Disabilities of the Arm, Shoulder, and Hand (Quick-DASH) scores at 3, 6, and 12 months. Radiographs were reviewed for malunion, and complications and range of motion (ROM) were also evaluated

Results: Of the 135 patients analysed, no differences were observed in pain or functional outcomes between the two groups at any time point. VAS scores 10 days post-cast removal were similar (group I: 3.87; group II: 4.00, $p = 0.67$), as were PRWE and Quick-DASH scores after 1 year (PRWE: group I: 14.18; group II: 15.51, $p = 0.686$; Quick-DASH: group I: 15.46; group II: 17.86, $p = 0.449$). Malunion rates were 29.9% in group I and 32.8% in group II ($p = 0.85$), with no significant differences in complications or ROM between groups

Conclusions: A 4-week immobilization period provides equivalent pain control, functional outcomes, and complication rates as a 6-week immobilization period in elderly patients with displaced DRFs treated non-operatively. A shorter immobilization period may, therefore, be safely recommended for treating these fractures.

A-0209 SOCIOECONOMIC FACTORS IN SURGICALLY TREATED AND UNTREATED NEUROMA AND NERVE INJURIES IN UPPER LIMB AND IMPACT ON CONSUMPTION OF PAIN MEDICATION

Emma Dahlin[1,2,3], Raquel Perez[1,4], Malin Zimmerman[1,3,5], Juan Merlo[4,6], Erika Nyman[2,7], Lars B Dahlin[1,2,5]

[1]Department of Translational Medicine – Hand Surgery, Lund University, Skåne University Hospital, Malmö, Sweden; [2]Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden; [3]Department of Orthopedics, Helsingborg hospital, Helsingborg, Sweden; [4]Unit for Social Epidemiology, Department of Clinical Sciences (Malmö) Faculty of Medicine, Lund University, Malmö, Sweden; [5]Department of Hand Surgery, Skåne University Hospital, Malmö, Sweden; [6]Center for Primary Health Research, Region Skåne, Malmö, Sweden; [7]Department of Hand Surgery, Plastic Surgery and Burns, Linköping University Hospital, Linköping, Sweden

Introduction: Management of neuroma and nerve injuries, with risk of residual problems and neuropathic pain, is still a challenge and factors "beyond surgery" must be considered. Socioeconomic factors in patients with such injuries, are unexplored and their risks associated to overuse of drugs, like opioids and neuropathic pain medication.

Aim: Our aim was to map socioeconomic factors and risks for "overuse" of opioids and neuropathic pain medication in

patients with surgically and non-surgically treated neuroma and nerve injuries in upper limb.
Material & Methods: From a Swedish record-linked database, consisting of five national registers, including information about demographic, socioeconomic factors, medical diagnosis, surgical procedures and prescription of medication, data were extracted from a final population of 5,625,751(age 25-80 years) after exclusion criteria [e.g., death, emigration, missing information, previous ICD-10 T-diagnose (sequel after nerve injury), or a previous nerve injury]. Neuroma and nerve injury patients were portrayed as a diagnosis of sequel after nerve injury (T92.4), a neuroma of amputation stump (T873B,C,D) or a nerve injury (ICD-10 S-diagnosis) in upper limb (excluding nerve entrapment disorders G56), with or without related surgeries (NOMESCO codes; surgery within 6 months from diagnosis) between 2011-2014. A multinominal logistic regression model examined relative risk [RR; 95% CI] of surgically and non-surgically treated neuroma or nerve injury associated with demographic and socioeconomic factors (model 1 crude; model 2 adjusted for age, sex, income, cohabitation and country of birth). Furthermore, use of opioids and neuropathic pain medication (ATC-codes; washout period 120 days post-surgery) related to controls, expressed as Odds Ratio (OR; 95% confidence interval (CI)), was calculated.
Results: Amongst the included population, surgically untreated (n=608) and treated (n=189) neuroma and untreated (n=3719) and treated (n=2122) nerve injuries according to the definitions were found. Only for treated neuroma, a higher RR (1.51 [1.13-2.03]) was found for women, while for the other diagnostic groups the risks were lower in women (RR 0.42-0.76). Higher RR for having an untreated nerve injury was associated with low income [1.14 (1.05-1.24)] and being native [1.14 (1.04-1.26)]. A higher RR was observed for having a treated nerve injury among those with middle income ([1.17 (1.05-1.31)]. A lower RR was found for having an untreated neuroma among natives [0.79 (0.64-0.98)]. Generally, no other associations between demographic and socioeconomic factors were found, except a lower risk for a treated nerve injury in the higher age groups [65-80 years: 0.38 (0.31-0.43)]. However, individuals with neuroma or nerve injuries, irrespective of surgery, showed an increased risk of consumption of pain medication, adjusted for demographic and socioeconomic factors, where being woman [1.42 (1.39-1.45)], increasing age [highest 55-64 years: 1.83 (1.76-1.91)], having a low [1.98 (1.92-2.04)] or middle income, being native [1.07 (1.03-1.10)] and living alone [1.49 (1.46-1.53)] were associated with higher risks of consumption.
Conclusions: Demographic and socioeconomic factors should be considered when evaluating individuals with surgically untreated or treated neuroma and nerve injuries, in which there is a high risk for consumption of opioids and medications for neuropathic pain irrespective of surgery.

A-0210 ANATOMICAL APPROACH TO HAND REJUVENATION: THE ANATOMICALLY BASED (AB) INJECTION TECHNIQUES

Lorenzo Garagnani[1,2,3]
[1]Guy's and St Thomas' NHS Foundation Trust, London, UK; [2]King's College London, UK; [3]SE1 Medical Aesthetics, London, UK

Introduction: Historically, non-surgical rejuvenation has focused predominantly on facial treatments. Facial anatomy is part of the standard training in aesthetic medicine. Although the importance of hand rejuvenation is increasingly recognised, the literature on this topic has analysed only some aspects and the global hand surgery community has not been involved.
Aim: This study aims to fill the gaps in the current literature regarding specific injection techniques for non-surgical hand rejuvenation, describing an anatomically based approach to injections of dermal fillers and skin boosters and advocating the involvement of the global hand surgery community in this practice.
Material & Methods: The specific, anatomically based aesthetic injection techniques described in this study are based on established anatomical knowledge, further confirmed by 26 cadaveric hand dissections performed by the Author and his longstanding clinical experience as both a Hand Surgeon and Aesthetic Physician

Results: Specific injection sites and techniques have been developed based on the aesthetic indication and anatomical features of the hand, in areas where the risk of accidental damage to blood vessels, nerves, tendons, ligaments, muscles and other structures can be reduced. Novel techniques and indications for aesthetic injections have also been described.
Conclusion: Adequate anatomical knowledge and training, combined with awareness of specific indications, risks and potential complications, allows for the appropriate and safer planning and execution of hand injections for aesthetic purposes.

A-0211 A NOVEL FREE VASCULARIZED BONE GRAFT FOR SMALL BONE DEFECTS IN THE HAND: 4TH EXTENSOR COMPARTMENT ARTERY TECHNIQUE

Yeongyoon Koh, Jan Jun Nam, Jong Woong Park, In Cheul Choi
Korea University Anam Hospital, Seoul, Korea

Free vascularized bone grafts (FVBGs) are commonly used in cases requiring enhanced healing due to compromised local blood supply or in complex, large bone defects. FVBGs provide both structural support and vital blood supply, improving the chances of successful union. These grafts are especially valuable when conventional bone grafting is likely to fail due to inadequate blood supply or other complicating factors.
For small bone defects that require vascularized bone grafting of the hand, such as scaphoid nonunion, pedicled bone grafts from surrounding tissues are primarily used. When FVBG is required, the medial femoral condyle (MFC) has been commonly utilized as the donor site. However, despite its effectiveness, the free medial femoral condyle (MFC) vascularized graft has limitations when used for scaphoid nonunion, such as donor site morbidity and the need for a distant graft location.
Surgical Technique: Harvest of Bone Graft
A dorsal longitudinal incision was made, centered over Lister's tubercle and the distal radius. The interval between the fourth and fifth extensor compartments was then identified. Careful dissection of the floor of the fourth extensor compartment was performed to locate the 4th ECA. After isolating the 4th ECA, it was ligated and divided proximally. An appropriately sized graft was then harvested from the distal radius, about 1 cm proximal to the radiocarpal joint
Case 1: A 58-year-old right-handed female presented with an infectious condition of the second finger on her right hand. After infection control, her second finger had an 8 mm bone defect. She wished to preserve her key pinching function. We performed a 4th ECA vascularized bone graft with anastomosis to the radial-sided digital artery and dorsal vein, along with the fixation of two K-wires for fusion of the second DIP joint. At five weeks postoperatively, X-rays confirmed bone union, and after six weeks, she was able to write with her right hand.
Case 2: A 54-year-old male, a heavy smoker, presented with scaphoid nonunion and humpback deformity. After debridement of the fracture site and correction of the deformity, an 8 mm bone defect remained on the volar side of the fracture. We harvested a free 4th ECA vascularized bone graft from the ipsilateral dorsal wrist. The graft was anastomosed to the radial artery and vein, similar to a free MFC graft. Six weeks postoperatively, scaphoid union was achieved.
Conclusion: The free 4th ECA vascularized bone graft offers a viable alternative to the MFC graft for addressing small bone defects in the hand that require vascularized support.

A-0212 SELECTIVE TORSION OF THE ANTERIOR INTEROSSEOUS NERVE BRANCH TO THE FLEXOR POLLICIS LONGUS: A REPORT OF TWO CASES

Yeongyoon Koh, Jae Jun Nam, Jong Woong Park, In Cheul Choi
Korea University Anam Hospital, Seoul, Korea

Abstract: Recently, cases of nerve torsion leading to hourglass-shaped stenosis have been increasingly reported. The typical anterior interosseous nerve (AIN) syndrome occurring around the pronator teres and that resulting from interosseous nerve torsion at the elbow can be easily misdiagnosed; therefore, accurate diagnosis is essential for establishing an appropriate treatment plan. In this study, we report two clinical cases of patients who presented with loss of flexor strength of the thumb without prior trauma, diagnosed with selective torsion of the AIN branch supplying the flexor pollicis longus via high-resolution ultrasound who subsequently underwent surgical treatment.

Case 1: A 34-year-old female patient presented with loss of flexor strength of the right thumb from 6 months ago; pain from elbow to the affected digit was noted, followed by the loss of flexor strength. Three months after symptom onset, an electromyography performed at another hospital confirmed anterior interosseous nerve involvement. An abnormal "OK sign" was observed, but flexion of the distal interphalangeal joints of the second and third digits was normal; and atrophy of the thenar eminence was not observed. High-resolution ultrasound transverse scans conducted at our institution revealed a significant change in nerve size suggesting nerve torsion at the AIN branch, located 7 cm above the elbow. Despite observation, the patient's symptoms did not improve; consequently, exploration surgery was performed 9 months after symptom onset. During surgery, we approached the area identified as torsion on preoperative ultrasound. The epineurium of the affected nerve was incised under microscopy. After untwisting, an internal fascicular rupture was confirmed and the hardness suspecting fibrosis within the proximal enlarged nerve were checked. so, the affected segment was excised. A 1.5 cm segment of the lateral antebrachial cutaneous nerve was then grafted to the defect. Sensory disturbance in the donor area resolved after 3 months post-surgery, with improvement in thumb flexion to M3 by 5 months. By 7 months post-surgery, the power of thumb flexion was improved to be able to perform pinch.

Case 2: A 58-year-old female presented with loss of flexor strength in the right thumb from 7 days ago. She has no history of trauma prior to the onset of symptoms. During the initial visit, high-resolution ultrasound was performed; however, no definite sign of torsion was observed. Follow-up ultrasound examinations at one-month intervals revealed signs of torsion starting from the third month of symptom onset. Subsequently, an electrodiagnostic study confirmed incomplete AIN neuropathy, leading to a decision for surgical intervention. Surgery was performed 4 months after symptom onset. Ultrasound revealed nerve bundle swelling at the AIN; however, given the shorter duration from symptom onset to surgery, only the entrapment site was excised, followed by epineural suturing.

Conclusion: AIN syndrome due to nerve torsion requires differentiation from compressive neuropathies. Timely diagnosis and determination of the need for surgical intervention are critical. When clinical suspicion of AIN syndrome arises, particularly in atypical cases, consider the possibility of selective branch torsion and to conduct a high-resolution ultrasound examination above the elbow.

A-0213 SPONTANEOUS RECOVERY OF ACTIVE SHOULDER EXTERNAL ROTATION IN PATIENTS WITH BRACHIAL PLEXUS BIRTH INJURY

Maria Hyttinen[1], Henrikki Rönkkö[2], Pasi Paavilainen[3], Mika Helminen[4], Jarkko Jokihaara[1,2]

[1]Faculty of medicine and health technology, Tampere University, Tampere, Finland; [2]Division of musculoskeletal diseases, Tampere University Hospital, Tampere, Finland; [3]Pihlajalinna Hospital, Tampere, Finland; [4]Tays Research Services, Tampere University Hospital, Tampere, Finland and Faculty of social sciences, health sciences, Tampere University, Tampere, Finland

Introduction: Brachial plexus birth injuries (BPBI) occur as a result of a difficult delivery. External rotation of shoulder (ER) is usually one of the last movements which may recover. There is no consensus about the predicting factors for spontaneous recovery or the optimal timing for surgical treatment of ER in BPBI patients

Aim: The aim of our retrospective study was to describe spontaneous recovery of active ER and evaluate predicting factors for the recovery
Material & Methods: We screened 562 patients and identified a consecutive cohort of 103 BPBI patients, who had no active ER at the age of 3 months. We systematically collected clinical data on recovery. In addition, we assessed whether early recovery of elbow flexion, shoulder abduction or Narakas grade at 1 month predicts ER recovery
Results: Fifty-two (51%) patients spontaneously recovered ER, 44% of whom were recovered by the age of 1 year, 83% by 1.5 years, 92% by 2 years and 98% by 3 years. A breakpoint in the slope of the curve showing proportion of recovered patients occurred at 2 years of age. Recovery of active ER was significantly associated with early elbow flexion and Narakas grade at 1 month, but not with early active shoulder abduction
Conclusions: Most spontaneous recovery of ER in patients with BPBI occurs until 2 years of age, which thus can be considered a meaningful follow-up period for spontaneous recovery of ER. This information should be considered when making decision about peripheral nerve transfer surgery to improve ER in BPBI.

A-0214 THE IMPACT OF CMC-1 ARTHRITIS ON HEALTH-RELATED QUALITY OF LIFE AND ITS COMPARISON TO HEALTH-RELATED QUALITY OF LIFE IN CARPAL TUNNEL SYNDROME AND OTHER DISEASES

Justin D. Postma, Marius A. Kemler
Martini Hospital, Department of Plastic Surgery, Groningen, Netherlands

This prospective cohort study assessed the impact of carpometacarpal (CMC-1) osteoarthritis on health-related quality of life (HRQoL) from a societal perspective, comparing it to carpal tunnel syndrome (CTS) and other diseases using EQ-5D-3L, PRWHE, and qDASH questionnaires. Additionally, we evaluated the effect of trapeziectomy at 3 and 6 months postoperatively on EQ-5D index improvement and cost per quality-adjusted life year (QALY) gained. The baseline mean EQ-5D index was 0.71 (SD: 0.25), comparable to conditions such as myocardial infarction, Crohn's disease, and lower back pain. Trapeziectomy improved HRQoL at 3 months (mean +0.046, 95% CI [0.088, 0.003]) and 6 months (mean +0.06, 95% CI [-0.05, 0.11]). CMC-1 osteoarthritis patients exhibited lower baseline HRQoL than CTS patients. Overall, CMC-1 osteoarthritis significantly impacts HRQoL, and trapeziectomy offers notable improvement at a cost of €3300.60 per QALY gained.
Level of evidence: III

A-0215 FAVORABLE OUTCOMES WITH SUBCUTANEOUS ANTERIOR TRANSPOSITION OF THE ULNAR NERVE WITHOUT GANGLION EXCISION IN CUBITAL TUNNEL SYNDROME CAUSED BY INTRANEURAL GANGLION CYSTS

Shigeru Kurimoto[1], Takashi Hamada[1], Tadahiro Sakai[1], Michiro Yamamoto[2]
Toyota Memorial Hospital, Toyota, Japan; [2]Nagoya University, Nagoya, Japan

Introduction: Intraneural ganglion form mucinous cysts within the epineurium of peripheral nerves, causing neuropathy. The ulnar nerve ganglion is the second most commonly reported intraneural ganglion, but the mechanism of its formation and the surgical procedure of choice are still controversial.
Aim: The purpose of this study is to demonstrate that favorable outcomes can be achieved through subcutaneous anterior transposition, without the need for ganglion excision or internal neurolysis, in patients with cubital tunnel syndrome associated with intraneural ganglions.
Material & Methods: Two patients were treated for cubital tunnel syndrome with intraneural ganglions. Electrodiagnostic

tests were performed on each patient to support the diagnosis of ulnar neuropathy. Magnetic resonance and ultrasoud imaging evaluations showed cystic masses within the ulnar nerves and the diagnosis was made intraoperatively. Both patients were treated with subcutaneous anterior transposition of the ulnar nerve

Results: Intraoperative findings showed that both cases had the enlarged ulnar nerves due to the cysts and stalks distal to the posterior oblique ligament of the medial collateral ligament that continued to the joint capsule. No internal neurolysis or ganglion excision was performed, but only subcutaneous anterior translation of the ulnar nerve was performed. Postoperative follow-up averaged 4.8 years, and no recurrence of the ganglions has been observed. The mean postoperative grip strength on the affected side, compared with the unaffected side, significantly increased from 78% to 98%. Overall function, according to the Hand 20, showed an average improvement of from 30 to 12.5. Pain decreased by 45% according to the numerical rating scale. Postoperative ultrasound and magnetic resonance imaging showed no recurrence of the intraneural ganglion

Conclusions: With the development of imaging equipment, reports showing the continuity of the intraneural ganglion to the joint have increased. Our surgical findings support the idea that the pathogenesis of the intraneural ganglion originates in the articular region. Subcutaneous anterior transposition was performed in the patients with cubital tunnel syndrome with intraneural ganglion, and the midterm results showed that there was no recurrence of the intraneural ganglions. Therefore, we believe that there is no need to perform internal neurolysis or ganglion removal, but only subcutaneous anterior transposition of the ulnar nerve.

A-0216 RADIOGRAPHIC JIGS IMPROVE IMAGING ACCURACY OF THE THUMB CARPO-METACARPAL JOINT

Natan SIlver, Tom Cash, Claire Harding, Sumedh Talwalkar
The Wrightington Upper Limb Unit, Wigan, UK

Introduction: The thumb carpo-metacarpal joint (CMC) is a common site of osteoarthritis, frequently requiring surgery. Arthroplasty of this joint is growing in popularity and requires careful pre- and post-operative radiographs. This complex saddle joint has an orientation offset from that of the hand and wrist making it challenging to image. Despite several well-described radiographic techniques, there is often difficulty obtaining good images

Aim: This study aims to develop radiographic jigs for obtaining consistently accurate images of the thumb CMC joint

Material & Methods: Custom jigs were developed collaboratively between fellowship-trained hand surgeons and a senior hand therapist. Orfit Eco, a high-quality recycled thermoplastic material, was chosen due to its non-stick coating and good rigidity. The 2.4mm perforated option was used to minimise image artifact.

Jigs were fashioned by positioning a large live hand in the correct position to obtain 3 radiographic views and the material then moulded around it. Strut supports were integrated into the design to enable the jigs to be placed stably on a horizontal surface.

The views used were Kapandji PA, Kapandji lateral and the Bett view as they image the joint well and are relatively easy to obtain.

Following use of these jigs informal feedback was received from radiographers and patients

Results: Images obtained using these jigs were consistently accurate and negated the need for additional radiographs. One size was adequate to accommodate all patients, with padding used to position smaller hands. There was high satisfaction from radiographers and patients

Conclusions: The development of these custom jigs allows consistently accurate imaging of the thumb CMC joint. The jigs are easy to manufacture using materials available in any hand therapy department and involve minimal costs. Use

of these jigs saves time and reduces radiation exposure whilst improving radiographs. This of particular relevance to centres providing an arthroplasty service.

A-0217 SURGICAL TECHNIQUE: 'PERFORATE AND FILL' TECHNIQUE OF BONE GRAFTING FOR SCAPHOID FRACTURE FIXATION

Mehek Gupta, Bernice Qi Hui Heng, Mala Satkunanantham, Tina Munn Yi Lee, Jieying Xu, Lam-Chuan Teoh
Tan Tock Seng Hospital, Singapore, Singapore

Introduction: We introduce the 'Perforate and Fill' technique for bone grafting of scaphoid fracture with delayed union and non-union, which preserves the cartilage shell and does not break open the fibrous non union. This paper describes the technique and reports the experience in 11 scaphoid fractures.
Methods: The records of 11 patients whose scaphoid fractures were managed surgically with this bone grating technique from our institution from Jul 2017 - June 2024 were reviewed retrospectively. Patient and fracture factors, radiographic measurements of bone defect, post operative films and subjective and objective outcomes were considered
Results: The radiographic union of the fracture ranges from 36 to 110 days (an average of 68 days). In the last follow-up review, the affected wrists were pain free in all cases, and they were able to resume their premorbid status of vocation and resumed all physical activities. In nine cases their total wrist motion (TWM) measured 1300 to 1950 (an average of 1720 and is 93% of the opposite wrists). In these nine cases their grip strengths measured 28Kg to 50Kg (an average of 31.5Kg and is 97% of the opposite hands)
Conclusions: In treatment of scaphoid fracture delayed union and non-union, the 'Perforate and Fill' technique of bone grafting is a good alternative to the conventional wedge grafting technique. The advantage of keeping the intact cohesive union of cartilage shell and less invasive approach may have contribute to the success of the fracture union in our 11 cases using this technique.

A-0218 A SHAPE COMPLETION MODEL FOR CORRECTIVE OSTEOTOMY OF DISTAL RADIUS MALUNION

Camiel J. Smees[1,2], Judith olde Heuvel[1], Stein van der Heide[2], Esmee D. van Uum[2], Anne J.H. Vochteloo[1], Gabriëlle J.M. Tuijthof[2]
[1]OCON Centre for Orthopaedic Surgery, Hengelo, the Netherlands; [2]University of Twente, Enschede, the Netherlands

Introduction: 3D corrective osteotomy planning is increasingly becoming the standard practice in treating radius malunion. 3D planning relies on mirroring and aligning the healthy contralateral CT-based radius with the affected radius to assess the degree of malalignment. An important drawback of this approach is the requirement of a healthy contralateral radius, which is not always available. A solution to this problem could be the use of a shape completion model, which could reconstruct a healthy bone from the unaffected portion of the malunited bone. Although shape completion models already exist, it is often unclear how these models were developed and how reliable they are in clinical settings
Aim: The aim of this study is to develop a distal radius shape completion model and to validate this model for clinical use
Material & Methods: A statistical shape model (SSM) was developed based on segmented CT scans of 80 healthy radii. This SSM was expanded into a shape completion model to predict the distal 12% of the radius based on the proximal 88%. The distal 12% approximately corresponds to the typical fracture site in metaphyseal distal radius fractures. Ten additional CT scans were used to validate the model and set hyperparameters. Finally, the model's performance was tested on ten more CT scans

Results: The shape completion model's average accuracy, measured by a root mean square difference, was 0.38 mm (SD 0.08) and the average Hausdorff distance was 4.73 mm (SD 1.40). Mean absolute differences were 2.62° (SD 1.74) for radial inclination, 3.55° (SD 2.22) for volar tilt, and 2.56° (SD 2.80) for axial rotation. The most notable difference was found in length (1.74 mm, SD 1.14)
Conclusions: The developed shape completion model produces clinically useable models with error margins comparable to those in literature. The relatively large length discrepancies can be corrected for using the ipsilateral ulna, nullifying the impact of this error. Furthermore, some outliers remain which require further investigation. Future research should compare the shape completion model to the use of the contralateral radius to determine the optimal technique.

A-0219 A MINIMALLY INVASIVE SURGERY TRIAL FOR DISTAL RADIUS FRACTURES IN THE ELDERLY USING MIPO PLATES

Yoshihiro Dohi, Shuhei Suzuki
Yao Tokushukai General Hospital

Introduction: Minimally invasive surgery using plates specialized for distal radius fractures is becoming more common. At our hospital, we also perform minimally invasive surgery, including anesthesia, for elderly patients who require surgery
Aim: We will investigate and report on the MIPO method, anesthesia method, and postoperative results for elderly patients with distal radius fractures
Material & Methods: We investigated 6 cases of distal radius fractures in patients aged 72 to 94 years (average age 80 years) treated with a 2 cm incision and MIPO plate. We investigated the fracture type, preoperative complications affecting surgery and anesthesia, living environment, anesthesia method, surgery time, hospitalization period, living situation after discharge, and postoperative results
Results: The fracture types were type A in 4 cases and type C in 3 cases. There were 1 case each of interstitial pneumonia, heart failure, and WPW syndrome chronic leukemia in remission as preoperative complications. There were 2 cases of patients requiring long-term care, 2 cases of patients living alone, and 1 case of elderly patient caring for another elderly patient. General anesthesia was used in four cases. Three cases of heart failure, WPW syndrome, and living alone were operated on using ultrasound-guided peripheral nerve block anesthesia. The average operation time was 61 minutes (41-70 minutes), and tourniquets were used in three cases of general anesthesia. The average length of hospital stay was 4.7 days (1-15 days), and all patients were able to maintain their previous lifestyle, with both of the working patients returning to work. The postoperative results were an average Mayo score of 78.6 points (Excellent: 1, Good: 5, Fair: 1) and an average Q-DASH score of 9.1 points (0-20 points)
Conclusions: In the elderly, there are cases where it is not possible to maintain a lifestyle with a cast due to factors such as living alone, nursing care, or walking ability. In addition, there are cases where the anesthesia method is limited due to preoperative complications. Even in cases that had been treated conservatively in the past, it was thought that by actively performing surgery using the minimally invasive techniques and anesthesia methods devised this time, it was possible to return to and maintain a normal lifestyle.

A-0220 ULNAR SIDED WRIST PAIN TREATMENT OUTCOMES : WHAT DO OUR PATIENTS REPORT?

Wendy Medeiros, Susan Barlow, Jan-Stephan Scholtz
University of Lynchburg, Lynchburg, VA, USA

Introduction: Ulnar-sided wrist pain (USWP) can be difficult to accurately diagnose, and subsequently treat, due to the presence of the multitude of structures in this region which has the potential to influence symptoms. The management of USWP has been influenced by advancements in arthroscopic diagnosis which advanced the work of Palmer and Werner, specifically with regards to treatment of Triangular Fibrocartilage Complex (TFCC) tears. Patient-reported outcome measures (PROM's) offer a valuable lens through which to assess treatment efficacy, providing insights into how pain and dysfunction impact daily activities and overall well-being from the patient's viewpoint.
Aim: The aim of this study was threefold. First, to describe the patient-reported outcomes of participants with USWP using the QuickDASH-9 survey. Second, to determine the statistical significance of measured variables against the reported outcomes of USWP patients. Third, to add to the existing body of data that discusses PROM's for USWP
Material & Methods: The Institutional Review Board of the University of Lynchburg approved this retrospective survey study (approval number LHS2324078) and deemed it as exempt. All individuals that participated in this study signed an informed consent document indicating that they confirm the sharing of their survey responses with the researchers. Participants (n=272) were previously recruited via circulation of an online-survey via email and social media platforms. Statistical analysis was performed using SPSS version 28. Descriptive statistics were used to calculate participant demographic data. Independent samples T-tests were performed to determine the presence of statistically significant differences between DASH scores. A total of 272 survey responses were retrieved of which 66 surveys were incomplete and disregarded for analysis, leaving 206 participant surveys for further analysis.
Results: Among the 206 participants the duration of USWP experienced at the time of survey completion consisted of: 37 participants (17%) less than 1 year, 117 participants (56.8%) between 1 and 5 years and 54 participants (26.2%) more than 5 years. Of the 206 participants, 73 participants (35%) reported having had a fracture and 159 participants (77%) reported receiving a TFCC diagnosis from a medical professional. There was no significant difference found between QuickDASH-9 results, duration of USWP experienced, history of wrist surgery or fracture. A significant difference was found between the QuickDASH-9 outcomes of patients with USWP who received a TFCC tear diagnosis, with QuickDASH-9 result being impacted negatively compared to those who did not receive a TFCC tear diagnosis.
Conclusions: Patients who reported that their USWP had healed, had significantly better QuickDASH-9 scores than those who did not. Patients who reported that they were diagnosed with a TFCC tear had worse QuickDASH-9 scores compared to those who did not receive a TFCC tear diagnosis. There was no significant difference among QuickDASH-9 scores for patients who had received surgical care, non-surgical care or fractured their wrist. Furthermore, the majority of patients in this cohort reported that they did not feel as though their USWP had healed.

A-0221 PATTERNS OF TRAUMATIC BRACHIAL PLEXUS INJURIES: A NATIONWIDE STUDY OF GEOGRAPHIC, DEMOGRAPHIC, AND SOCIOECONOMIC FACTORS IN ENGLAND AND WALES

Chiraag Karia[1], Abbey Boyle[1], Stephen Clarke[2], Solomon Nelson-Ashley[1]\r\nGrainne Bourke[1]
[1]Leeds Teaching Hospital NHS Trust, UK; [2]University of Leeds, UK

Introduction: Traumatic brachial plexus injuries (TBPIs) are severe, life-altering injuries with long-term physical, psychological, and socioeconomic impacts, costing an estimated £873,000 per patient. Recent increases in TBPI incidence have been linked to high-speed road traffic collisions (RTCs), with evidence that socioeconomic disparities influence trauma rates. However, UK data on how geographic and socioeconomic factors impact TBPI incidence and distribution remain limited.
Aims: To examine the geographical and socioeconomic variation in TBPI incidence across England and Wales, identifying high-risk populations and "hotspots" to inform targeted public health interventions and resource allocation.

Materials & Methods: A cohort study was conducted using prospectively collected data from the Trauma Audit and Research Network (TARN) and STATS-19 road traffic accident database from January 2010 to March 2022. Patients with confirmed TBPIs meeting TARN inclusion criteria were included. Cases were categorised as vehicular collisions or around-home injuries (non-vehicular). Key variables analysed included demographics, injury mechanisms, Index of Multiple Deprivation (IMD) scores, and urban-rural classification. For around-home injuries, IMD scores were applied based on casualty home postcode regions, while for vehicular injuries, the distance between home and incident location was calculated
Results: A total of 1,003 TBPI cases were identified: 601 (60%) from vehicular collisions and 402 (40%) from around-home injuries. Vehicular TBPIs were more prevalent among younger males (median age 35.4 years), whereas around-home TBPIs primarily affected older females (median age 62.7 years). Higher IMD scores were significantly associated with penetrating TBPIs, such as stabbings, which were concentrated in urban areas. Cities including Manchester, London, and Birmingham emerged as TBPI "hotspots," particularly for penetrating injuries in high-deprivation neighbourhoods. The most common mechanism for around-home TBPIs was a fall of less than 2 metres, accounting for 56% of cases, with older females over-represented. Geographic analysis revealed that 76% of around-home TBPIs occurred in urban areas. Vehicular TBPIs were often associated with road speeds of 30 mph and 60 mph, with over a quarter occurring at T or staggered junctions. Males were found to travel shorter distances from home before sustaining a TBPI compared to females, potentially reflecting higher engagement in local high-risk behaviour
Conclusions: This study highlights the influence of socioeconomic factors, age, and gender in TBPI distribution, supporting the need for targeted violence-prevention initiatives in urban, high-deprivation areas and age-specific fall-prevention strategies. Road safety measures for high-risk groups, such as young male drivers, could reduce TBPI incidence. Identifying injury "hotspots" enables prioritisation of resources and public health interventions in high-need areas, potentially reducing the incidence and healthcare burden of TBPIs across England and Wales.

A-0222 FROM FRACTURE TO PREVENTION: EVALUATING FRAX SCORES AND DEXA SCAN REFERRALS IN HAND TRAUMA PATIENTS

Chiraag Karia, Tabitha Champion, Grainne Bourke
Leeds Teaching Hospitals NHS Trust, UK

Introduction: Fragility fractures due to low-impact trauma are a growing concern in older adults, often indicating underlying osteoporosis or reduced bone density. Despite the associated risks, only a small fraction of these patients—between 1% and 13%—receive appropriate osteoporosis treatment. The Fracture Risk Assessment (FRAX) tool is used to estimate a patient's 10-year risk of major osteoporotic and hip fractures, with a score threshold of 10% recommended for Dual-Energy X-ray Absorptiometry (DEXA) scans. Current practices in hand trauma settings often overlook these evaluations, potentially missing opportunities for early osteoporosis detection and intervention.
Aim: To assess FRAX scores in patients with fragility fractures within our hand surgery unit and evaluate the rate of appropriate referrals for DEXA scans. Through this, we aim to identify gaps in osteoporosis management and propose improvements to screening and preventive measures for at-risk patients.
Material & Methods: This retrospective, cross-sectional study included patients referred to the hand trauma clinic within the Plastic Surgery Department at Leeds Teaching Hospitals NHS Trust from December 2023 to January 2024. We included all patients aged 40 to 90 years who sustained a fragility fracture, defined as a fracture resulting from a fall from standing height or less. Data collected included patient demographics, FRAX scores, and referral status for DEXA scans. A subset of the cohort was also analyzed for 2nd Metacarpal Cortical Index (2MCI) as a potential marker for osteoporosis risk

Results: Among 520 patients referred during the study period, 42 (8%) had sustained a fragility fracture. Of these, 57% had FRAX scores exceeding the 10% threshold, indicating a high risk and need for DEXA referral. However, none of these high-risk patients had been referred for DEXA scans at the time of their injury. Further analysis revealed that high FRAX scores were significantly associated with female patients and older age groups. Initial intervention following presentation of these findings has led to increased DEXA scan referrals, with most returning positive for osteopenia or osteoporosis
Conclusions: Our study highlights a critical gap in osteoporosis screening for hand fracture patients with elevated FRAX scores. Implementing routine FRAX assessments and a structured protocol for DEXA referrals in this population could enable earlier detection and treatment of osteoporosis, potentially reducing future fracture risk. Collaborative efforts, including cross-departmental training and streamlined referral processes, are essential next steps in addressing this issue and enhancing patient outcomes.

A-0223 UTILISING ARTIFICIAL INTELLIGENCE IN UPPER LIMB PERIPHERAL NERVE INJURY: A SCOPING REVIEW

Chiraag Karia, Irina Mironosetskaya, Hannah Whittaker, Grainne Bourke
Leeds Teaching Hospitals NHS Trust, UK

Introduction: Peripheral nerve injuries (PNIs) to the upper limb present significant challenges in clinical diagnosis, management, and rehabilitation, often leading to long-term impairment. Recent advancements in artificial intelligence (AI) have opened new possibilities for enhancing the care of PNIs, including applications in diagnostics, treatment, and patient monitoring. However, the integration of AI in this field remains limited and fragmented, necessitating a comprehensive review to identify current research trends and potential future directions.
Aim: This scoping review aims to map existing literature on the use of AI in PNI, highlighting research trends, application areas, and key challenges. The review also identifies gaps in current knowledge and areas where AI could further impact patient care.
Material & Methods: A systematic literature search was conducted across multiple databases, focusing on studies involving AI applications in the context of PNI. Following PRISMA guidelines, we screened 618 articles after duplicate removal, selecting studies based on relevance to AI-assisted PNI diagnostics, therapeutics, and patient management. The final selection included 52 studies published between 2019 and 2024, covering clinical research, imaging advancements, predictive modeling, and rehabilitation technologies. Studies spanned five continents, with the majority conducted in the USA, China, and Canada
Results: Thematic analysis revealed ten primary themes of AI application in PNI, with "peripheral nerve interfaces" as the most common. A significant focus was on AI-driven control of prosthetic limbs, where algorithms demonstrated high accuracy in translating motor intent into prosthetic movements. Other notable themes included imaging for diagnostic purposes, predictive modeling for recovery, and intraoperative detection. AI application for the brachial plexus comprised the largest share of papers (18%). Approximately 79% of studies were published in the last five years, indicating rapid growth in this research area. Despite promising developments, limited research was found in areas like drug discovery, tissue engineering, and electrical stimulation
Conclusions: AI holds considerable potential to transform PNI management by improving diagnostic accuracy, enhancing rehabilitation outcomes, and enabling sophisticated interfaces for prosthetics. However, significant gaps remain, especially in applications beyond prosthetic control and diagnostic imaging. Further interdisciplinary research is needed to address

these gaps and to develop robust, clinically integrated AI systems for comprehensive PNI care. Addressing challenges such as data availability, model interpretability, and integration into clinical workflows will be essential for advancing AI's role in PNI.

A-0224 INNOVATION IN UPPER LIMB SURGERY – ANALYSING FIFTY YEARS OF PATENT DATA

Chiraag Karia, Gurchandar Singh, Grainne Bourke
Leeds Teaching Hospitals NHS Trust, UK

Introduction: Technological innovation is a cornerstone of progress in upper limb surgery, where advancements have the potential to significantly improve patient outcomes. Despite this, the innovation landscape in upper limb surgery remains poorly quantified, with limited objective assessments of emerging technologies. Patents, as early indicators of technological breakthroughs, provide a unique lens through which to analyze trends and identify areas of high innovation activity. This study explores 50 years of patent data to map the technological landscape in upper limb surgery.
Aim: To characterise the primary areas of innovation in upper limb surgery by analyzing patent data from 1970 to 2023, identifying key technology clusters, and examining trends across different jurisdictions.
Material & Methods: A comprehensive patent search was conducted using the open-source platform Lens.org, covering over 135 million records from 105 jurisdictions. The search was restricted to patents filed between January 1, 1970, and January 1, 2023, filtered by the Co-operative Patent Classification (CPC) code A61, relevant to medical sciences. Patents were limited to granted, English-language documents, with duplicates removed through patent family filtering. Two independent reviewers screened abstracts to ensure relevance to upper limb surgery, with disagreements resolved by a third reviewer. Patents were categorized into twelve technology clusters based on thematic analysis, including surgical techniques, prosthetics and implants, fracture management, and surgical instruments. Data were normalized using an innovation index, and a five-year moving average was applied to visualize growth trends
Results: A total of 3,006 patents related to upper limb surgery were identified over the study period. Analysis revealed an exponential increase in patent activity, particularly from 2008 onwards. The most active technology clusters were surgical techniques (687 patents), prosthetics and implants (682 patents), and fracture management (366 patents). The geographic distribution of patents was dominated by filings in the US, Russia, and Europe, with significant growth in China and South Korea since 2008. The rolling average for each technology cluster indicated rapid innovation over the last 15 years, which has recently tapered, suggesting a maturation phase in several clusters
Conclusions: This study underscores the dynamic innovation landscape in upper limb surgery, driven by significant contributions in surgical techniques, prosthetics, and fracture management. The analysis also highlights the increasing role of emerging markets in global innovation. Patents, as a metric for technological progress, provide valuable insights for researchers, clinicians, and policymakers in prioritizing areas for further research and investment. Monitoring patent activity offers a unique and underutilized approach to understanding the trajectory of innovation, ultimately supporting advancements in patient care in upper limb surgery.

A-0225 NAVIGATING THE CHALLENGES IN EXCISING A GIANT LIPOMA OF THE HAND

Anuhya Vusirikala[1], Dhruv Vasooja[2], Micheal Fox[1], Marco Sinisi[1], Anna Panagiotou[1]
[1]Royal National Orthopaedic Hospital, London, UK; [2]Imperial College London, London, UK

Background: Giant lipomas (greater than 5cm in size) are rare, benign adipose tissue tumours of the hand. They present challenges due to their size and location and commonly necessitate surgical intervention. This case explores the diagnostic and therapeutic considerations when managing giant lipomas of the hand.

Case: A 69- year- old man presents with a progressive swelling of the left hand, increasing in size over the past 3 years, causing neuropathic pain and weak grip strength. There was a large swelling in the centre of the palm extending into the thenar and hypothenar eminence, with a further swelling in the dorsum of hand in between the middle and ring fingers, which was contiguous with the main swelling. There was sensory and motor deficit in the median and ulna nerves with a positive Tinel's at the carpal tunnel. There was no tendon dysfunction or vascular deficit. MRI scan revealed a well-differentiated lobulated mass in close proximity to the median nerve and its branches. Differentials included atypical lipomatous tumour, intraneural lipoma and fibrolipomatous hamartoma.

An incision along the palmar crease was used with a limited Brunner incision distally. The mass was deep to and stretching the palmar vascular arch, median nerve and its branches. A 11 x 8cm lesion was dissected out unimpaired from the surrounding tissues, preserving the neurovascular structures and the carpal tunnel was decompressed. Histological examination confirmed a lipoma.

At post-operative assessment the patient had a well healed scar with complete resolution of neuropathic pain and significant improvement in grip strength.

Conclusion: This case study highlights the importance of an MRI, to assist orthopaedic surgeons when planning the surgical approach for excision of giant lipomas whilst protecting the neurovascular structures. Careful planning results in a meticulous enbloc resection of the tumour resulting in excellent prognosis for the patient.

A-0226 DIFFERENTIATING CERVICAL SPONDYLOSIS FROM POSTERIOR INTEROSSEOUS NERVE PALSY

Takao Omura[1,2], Kaori Sugiura[2], Yukihiro Matsuyama[2]

[1]Department of Morimachi Surgical care, Hamamatsu University School of Medicine; [2]Department of Orthopaedic Surgery, Hamamatsu University School of Medicine

Introduction: Posterior interosseous nerve (PIN) palsy is characterized by dropped fingers and may be caused by spontaneous hourglass-like constriction or tumors, such as ganglions arising from the proximal radioulnar joint. Cervical lesions involving compression of the C8 root or the ventral horn at the C7 level can also present with symptoms mimicking posterior interosseous nerve paralysis.

Aim: This study aims to retrospectively review the clinical features of cervical spondylosis cases referred to us with a diagnosis of posterior interosseous nerve paralysis.

Material & Methods: This study reviewed 29 cases referred to our institute for the treatment of non-traumatic posterior interosseous nerve palsy between 2012 and 2024. Neurological symptoms were assessed in all patients, and 13 cases (12 males, 2 females; average age 65 years) who underwent further MRI examination were diagnosed with cervical spondylosis. We retrospectively analyzed the clinical symptoms, degree and distribution of muscle paralysis at initial presentation, radiological findings, electrophysiological test results, and final diagnoses

Results: Of the 13 cases, 3 presented with sensory disturbance in the forearm or hand, and 2 exhibited gait disturbance. All cases showed weakness in the extensor digitorum communis, with complete paralysis in 4 cases. Two cases presented with weakness in the extensor carpi radialis, and 12 cases exhibited weakness in the abductor pollicis brevis (APB), abductor digiti minimi (ADM), and first dorsal interosseous (IOD(1)) muscles. In cases with mild intrinsic muscle weakness, an

electrophysiological study comparing distal motor latency of the EDC muscle via Erb stimulation showed normal latency in comparison with the contralateral side. MRI of the cervical spine confirmed final diagnoses of cervical disk herniation in 5 cases, cervical radiculopathy in 4 cases, and cervical myelopathy in 4 cases. All cases were referred to spine surgeons, and 6 cases underwent surgical treatment

Conclusions: Cervical spondylosis can mimic PIN palsy symptoms but can be differentiated by careful examination of the APB, ADM, and IOD(1) muscles. In cases presenting with dropped fingers, a detailed assessment of these muscles and MRI examination are essential for an accurate diagnosis and appropriate treatment plan.

A-0227 LOWER SUBSCAPULAR NERVE TRANSFER TO THE MOTOR BRANCH OF THE TERES MINOR MUSCLE: AN ANATOMICAL STUDY

Renata Paulos, Marcelo Rosa
Hospital das Clínicas (USP), São Paulo, Brazil

Introduction: The lack of recovery of active external rotation of the shoulder is a common problem in cases of obstetric paralysis. The muscle imbalance generated by the absence of external rotation with the remaining strength of the shoulder's internal rotators is often pointed out as the main factor in the development of glenohumeral deformity.

Aim: Our study aims to examine the anatomy of the lower subscapular and axillary nerves to assess the feasibility of transferring the lower subscapular nerve to the motor branch of the teres minor muscle.

This is a surgical technique designed to restore active external shoulder rotation while simultaneously reducing the strength of the internal rotators.

Material & Methods: Twenty axillae were dissected. We documented the diameter of the axillary nerve, its anterior and posterior divisions, the branch to the teres minor muscle, and the lower subscapular nerve and its branches. The location and origin of the lower subscapular nerve and the motor branch to the teres minor muscle were observed, and the feasibility of tension-free suture for nerve transfer was analyzed. At the end of each dissection, samples of the lower subscapular nerve and the motor branch to the teres minor muscle were sent for axon count.

All data were stored in the RedCap program

Results: The lower subscapular nerve was always located in the interval between the circumflex scapular artery and the thoracodorsal artery. It originated from the posterior cord in 60%, from the axillary nerve in 20%, and from a common trunk with the axillary and thoracodorsal nerves in 20%; its average diameter was 1.90 mm (1.58 - 2.28 mm; SD: 0.17), and the axon count was 509.37 (167-787; SD 190.68). The branch to the teres minor muscle was always the most medial structure originating from the axillary nerve, with an average diameter of 1.91 mm (1.4-2.27 mm; SD: 0.23), and the axon count was 610.47 (281-970; SD 186.07).

In all cases, the donor nerve easily reached the recipient

Conclusions: The lower subscapular nerve transfer to the motor branch of the teres minor muscle is anatomically feasible. The axon counts of the nerves in question demonstrated compatibility between them.

A-0228 CONSENSUS AND GUIDELINE-BASED MANAGEMENT OF PERIPROSTHETIC INFECTIONS IN TMC JOINT ARTHROPLASTY

Victoria Struckmann[1], Simeon Daeschler[1,2], Benjamin Panzram[2]

[1]Department of Hand, Plastic and Reconstructive Surgery, Burn Center, Plastic and Hand Surgery University of Heidelberg, BG Trauma Center Ludwigshafen, Ludwigshafen, Germany; [2]Department of Orthopaedics, Heidelberg University Hospital, Heidelberg, Germany

Background: While postoperative infections in hand surgery are rare, the projected rise in TMC joint arthroplasties suggests that cases of periprosthetic joint infections (PJIs) may increase in the coming years. Currently, the literature on PJIs in TMC prostheses is sparse, leaving a gap in standardized guidelines specific to these infections. Existing protocols for PJIs in larger joints (such as the hip, knee and shoulder) provide a foundation; however, there is a critical need for tailored guidelines in hand surgery, especially for infections related to TMC prostheses.
Methods: Using a Delphi consensus methodology, a preliminary set of questions on the management of PJIs in TMC prostheses was formulated by an interdisciplinary team of hand and plastic surgeons, microbiologists, and experts in septic surgery. These questions guided the development of structured questionnaires, which were subsequently distributed in three rounds to a panel of 7 European experts, averaging 12 years (range: 6-18) of experience with TMC endoprostheses. Over the three rounds, feedback from the panelists was collected, and the questions and statements were iteratively refined, achieving consensus by the third round. The process also included a detailed case study and incorporated guidelines from existing protocols on septic arthritis in prosthetic joints
Results: To be completed upon study completion.
Conclusion: This Delphi study establishes a consensus-based framework for managing periprosthetic infections in TMC joint prostheses, integrating both expert insights and established guidelines from larger joint arthroplasties. This approach addresses a critical gap in hand surgery, providing practical, guideline-informed recommendations for anticipated increases in TMC joint infections.

A-0230 ACROMETASTASIS VERSUS CHONDROSARCOMA OF THE HAND AS DIFFERENTIAL DIAGNOSES; CASE REPORT

Lorena Parra[1,2], Marisol Marti[2], Cristobal Greene[1,2]
[1]Hospital Dipreca, Santiago, Chile; [2]Clinica MEDS, Santiago, Chile

Introduction: The term acrometastasis refers to very rare bone tumors (0.1% of all bone metastases) located distal to the knee and elbow, and they are associated with a poor prognosis. They are commonly linked to primary cancers of the lungs, breast, gastrointestinal tract, and genitourinary system, with up to 10% being the first sign of an occult neoplasm. On the other hand, chondrosarcomas are the second most common malignant osteocartilaginous tumors, after osteosarcoma. Their presentation in the hand accounts for only 1-5% of cases, and their incidence as a synchronous neoplasm is under 1%.
Aim: To describe a clinical case of a hand tumor with an aggressive presentation, in which chondrosarcoma or acrometastasis from breast cancer were considered as differential diagnoses
Case Report: An 86-year-old female patient, with a history of stage IV breast cancer under palliative care, presents with a 6-month history of progressive growth and swelling at the level of the proximal phalanges of her left little finger. She was referred by her oncologist who presumed it was an acrometastasis. Upon clinical evaluation, the patient presented with a firm, indurated and erythematous mass, extending from the metacarpophalangeal joint to the distal interphalangeal joint, firmly adhered to deep planes, it was tender. Plain radiographs and MRI studies were ordered, revealing advanced osteolysis of the proximal phalanges, with involvement of surrounding soft tissues and destruction of neurovascular bundles, with areas of focal necrosis.
A block resection, including removal of the fifth ray, was performed. The biopsy results identified a malignant

chondrosarcoma. There has been no local recurrence to date
Conclusions: In this case, both differential diagnoses are rare, with similar and aggressive presentations, including invasion of the surrounding soft tissues and possible areas of necrosis, where biopsy is often the only option for a definitive diagnosis. While chondrosarcomas are more common, while still rare, it is important to keep in mind that 10% of acrometastases occur as the debut of an occult neoplasm, so when suspected, we must consider the possibility of a hidden primary cancer in order to refer the patient in a timely manner.

A-0231 RADIAL HEAD FRACTURES MASON TYPE III: OUTCOME AFTER TREATMENT WITH ORIF OR RADIAL HEAD REPLACEMENT

Eleftheria P Adaktylidou, Theodoros Mylonas, Ioannis Nastas, Efstratios Athanaselis, Nikolaos Stefanou, Zoe H. Dailiana, Sokratis E. Varitimidis
Universital Hospital of Larissa, Larissa, Greece

Introduction: Fractures of the radial head type Mason III are intra-articular fractures which can be related with elbow instability, mechanical blocking of the joint, and injuries of the proximal radioulnar joint and interosseous membrane
Aim: The purpose of this study is to compare the functional outcomes of the two methods that are used for the management of that type of fractures: ORIF (open reduction and internal fixation) and replacement of the radial head
Material & Methods: One hundred and twenty-two patients (75 men and 47 women) were included in this study. Eighty-three patients had an isolated radial head fracture and in 39 patients the fracture was a part of a terrible triad injury. In 79 patients the fracture occurred in the dominant upper extremity. Eighty-two patients were treated with ORIF and forty patients were treated with a metallic radial head implant (replacement management). Mean age of the first group (ORIF) was 39 years (17-81) and mean age of the second group (radial head replacement) was 47 (21-67)years. Mean follow up was 6.4 years for the first group and 5,2 years for the second group. Functional outcome was evaluated and measured with the Broberg and Morrey score
Results: Patients that were managed with replacement of the radial head presented better clinical outcome based on the Broberg and Morrey scores (91 3.2) compared to patients treated with open reduction and internal fixation (80 2.1). This difference was clinically significant ($p<0,01$). As for the ROM, patients treated with radial head implant had 88% excellent results in contrary to those with ORIF(69%). Complications occurred in both groups and included limited range of motion (ROM), heterotopic ossification, failure of osteosynthesis or loosening of the implant, and infection. Patients treated with replacement of the radial head had fewer complications (12 percent) than patients treated with ORIF (23 percent)
Conclusions: Operative management of radial head fractures type Mason III is challenging. Based on the results of this study, replacement of the radial head with a metallic radial head implant provides a better functional outcome compared to open reduction and internal fixation of these fractures. However, both methods are acceptable and provide satisfactory outcome.

A-0232 SIMPLE ELBOW DISLOCATIONS: COMPARISON OF OPERATIVE AND NONOPERATIVE MANAGEMENT

Eleftheria P Adaktylidou, Ekaterini Sourmenidi, Ioannis Nastas, Nikolaos Metaxiotis, Efstratios Athanaselis, Nikolaos Stefanou, Sokratis E. Varitimidis
Universital Hospital of Larissa, Larissa, Greece

Introduction: Elbow dislocation is the second most frequent type of large joint dislocations in adults and can be characterized as simple or complex depending on associated injury to adjacent structures. Treatment of simple elbow dislocation (SED), includes closed reduction, short-term immobilization of the elbow followed by functional aftercare. However, operative treatment is sometimes preferred to reconstruct the injured ligaments. Aim: The aim of this study is to compare operative and nonoperative management of a simple elbow dislocation based on a functional score
Material & Methods: Twenty-eight adult patients with SED were treated between 2010 and 2022 . Twenty-two patients were treated nonoperatively. Mean follow-up of the patients was 6.2 years. Closed elbow reduction was performed under anesthesia and was followed by short-term (one week) immobilization in a plaster splint. Active rehabilitation started after removal of the splint. Six patients were treated by closed elbow reduction under anesthesia and subsequent operative reconstruction of the ruptured collateral ligaments. Operative treatment was selected because of elbow instability after closed reduction. The lateral ulnar collateral ligament was always repaired with bone suture anchors. In case instability persisted, the medial collateral ligament was also repaired. Postoperatively, a plaster splint was applied to immobilize the elbow for three weeks and then active rehabilitation followed. The mean age of the nonoperatively treated patients was 58 years (from 15 to 65), while for the operatively treated patients mean age was 54 years (from 17 to 68). The outcome of management in both groups was evaluated with the Mayo Elbow Performance Score (MEPS)
Results: Long term stability of the elbow was achieved in all patients of both groups. Outcomes showed that prolonged immobilization in the group of surgically treated patients caused increased stiffness in flexion and extension with the need of longer rehabilitation. Extension deficit in nonoperatively treated patients was significantly smaller than that of the operative group (14+/-9 degrees vs 19+/-6 degrees, $p<0.05$). MEPS was better in the nonoperative group compared to operative group (95+/-7 vs 92+/-4) at 6 months without statistical significance. Restoration of prono-supination was instead always complete in both groups. Functional conservative treatment resulted in a higher range of motion and lower complication rate. Complications which presented (pain, residual instability, heterotopic ossification) had low rate with mild differences between the two groups
Conclusions: Careful evaluation of elbow stability after closed reduction of a simple elbow dislocation is crucial for further management. Patients with a stable elbow post-closed reduction should follow an early functional rehabilitation program after short immobilization in a splint. If the elbow shows signs of instability post-reduction, operative repair of the collateral ligaments is indicated. If these indications are followed, a great satisfactory outcome can be achieved.

A-0233 INTRANEURAL LIPOMA OF THE MEDIAN NERVE; A CASE REPORT

Marisol Marti C., José Luis Barria C., Julio Chavez B
Hospital Clinico de la Fuerza Aérea, Santiago, Chile

Introduction: Although benign lipomatous tumors are the most common neoplasms encountered by physicians, the most common location is in the subcutaneous tissue. Intraneural lipomas on the other hand, are quite rare, with most of the literature consisting on case reports. They are found predominantly in the upper extremities, having a higher incidence in the 4th and fifth decades of life. They can occur in any nerve, but the median nerve is the most commonly affected. Intraneural lipomas grow from the adipose cells located underneath the epineurium. Their clinical presentation can vary from a mere cosmetic concern, to neurovascular symptoms caused by compression
Aim: To describe the case of a rapidly growing intraneural lipoma of the median nerve, which mimicked carpal tunnel syndrome symptoms, its treatment and to review the existing literature
Case: An 58-years-old male patient, with no comorbidities, presents a history of 7 moths of a progressive growth on

the volar aspect of the distal third of his left forearm, initially without any pain, but with 2 months of shooting pain an paresthesia in the three radial fingers of the ipsilateral hand. He was referred by his general physician as a carpal tunnel syndrome and with an ultrasound that reported a concomitant subcutaneous lipoma. Upon clinical evaluation the patient presented with a soft painless mass, approximately 5cm long, not adhered to deep tissue nor to the flexor tendons, that appeared to be deep to the subcutaneous tissue. He had a positive Tinel sign at the mass, but not at the carpal tunnel, Durkan sign was also negative. Given the lack of consistency between the physical examination and the ultrasound report, an MRI was ordered, which showed a lipomatous mass completely embedded in the adipose tissue of the median nerve's epineurium, it was located distal to the origin of the palmar cutaneous branch and extended distally to about 1cm proximal to the carpal tunnel.
A total resection, with a careful dissection of the median nerve and its branches, was performed. A 6cm long and 2.2cm wide mass was resected, with no disruption nor injury to of any of the median nerve fascicles. The biopsy results confirmed a lipoma of the adipose cells within the epineurium of the median nerve. The patient made a full recovery, with no neurological deficits and a complete remission of his symptoms. There has been no local recurrence to date
Conclusions: Surgeons should be familiar with the clinical presentation and their characteristics in different imaging studies, having them in mind as part of the differential diagnosis in patients presenting with symptoms of peripheral nerve compression. Correctly identifying intramural lipomas and performing a careful dissection of the fascicles is key to avoid iatrogenic injury and to obtain a full resolution of the symptoms.

A-0234 ACUTE INJURIES OF THE ULNAR COLLATERAL LIGAMENT OF THE METACARPOPHALANGEAL JOINT OF THE THUMB. TREATMENT WITH USE OF BONE SUTURE ANCHORS

Eleftheria P Adaktylidou, Theodoros Mylonas, Ekaterini Sourmenidi, Alexandros Saridis, Nikolaos Stefanou, Efstratios Athanaselis, Sokratis E. Varitimidis
Universital Hospital of Larissa, Larissa, Greece

Introduction: Injuries of the ulnar collateral ligament (UCL) of the metacarpophalangeal (MCP) joint of the thumb are common and require accurate diagnosis and prompt treatment. Clinical findings and methods of operative treatment differ in acute and chronic injuries. These injuries should be recognized and treated urgently, in order to prevent function disability of the hand
Aim: The aim of this study is to present a simple operative technique for the reconstruction of the acute ruptures of the UCL of the MCP joint of the thumb, with the use of bone suture anchors
Material & Methods: Thirty-eight patients (28 men and 10 women) with acute rupture of the UCL of the MCP joint of the thumb, operated from 2004 to 2024 were included in the study. Mean age of the patients was 34 years (from 16 to 68). Nineteen patients were injured during sports activities, six had a fall from a height, six were injured at work, five in a traffic accident, and two were injured during an altercation. Clinical symptoms included severe pain during movements of the thumb, and inability of grasping even small objects. All patients had laxity at the ulnar site of the MCP joint of the thumb. Eleven patients had a dynamic radiographic evaluation which revealed a 20 degrees difference compared to the uninjured thumb. The average time for surgical treatment ranged from one to 20 days. All procedures were performed under axillary block. Incision was centered at the ulnar site of the MCP joint of the thumb. The adductor aponeurosis was exposed and incised to reveal the ruptured ligament. In 21 patients a Stener lesion was found. A bone suture anchor was inserted at the site of the avulsed ligament and the ligament stump was reattached with the sutures or the anchor. Adductor aponeurosis and the joint capsule were repaired for increased stability of the joint. The thumb was stabilized for 4 four weeks in a thumb spica

Results: Mean follow up was 7,2 years (from 1 to 10). The Glickel system was used for evaluation. Thirty patients had excellent, and eight had good results. There were no fair or poor results. Thirty-two patients reported no pain and six reported mild pain. Thirty-three patients regained full stability of the joint while five had a mild laxity. Pinch strength was 15 percent less than the opposite thumb. No painful neuromas were noted at the operative field. Range of motion was, at average, 15 percent less compared with the opposite thumb. Thirty-five patients reported complete use of the thumb while three avoided heavy strain of the thumb

Conclusions: Reconstruction of the ligament using bone suture anchors is an effective method for treatment of the acute injuries of the UCL of the MCP joint of the thumb. Complication rate is minimal, and the majority of the patients present with excellent of very good outcome.

A-0235 FOREARM FRACTURES: EPIDEMIOLOGICAL DATA, OUTCOME AND COMPLICATIONS AFTER OPERATIVE MANAGEMENT

Efstathios Konstantinou, Eleftheria P Adaktylidou, Alexandros Koskiniotis, Vasilios Akrivos Efstratios Athanaselis, Nikolaos Stefanou, Zoe Dailiana, Sokratis E. Varitimidis

Universital Hospital of Larissa, Larissa, Greece

Introduction: Forearm fractures are common and most of the times are the result of high energy. Mechanism is usually a direct force applied on the forearm and the typical patient is an adult active patient. These fractures are considered intra-articular fractures and must be treated operatively to achieve anatomic reduction.

Aim: The aim of this study is to present the epidemiological data, the outcome and the complications after management of these fractures with open reduction and internal fixation

Material & Methods: One hundred eighty-six patient treated for a forearm fracture from 2004 to 2024, were studied. Medical records and radiographs of the patients, preoperatively and postoperatively, were retrospectively evaluated. Time of fracture healing was recorded according to radiographic evaluation and the functional outcome was obtained by evaluating and interviewing patients at the latest follow up. The study included 54 men and 132 women with a mean age of 41 years (18 to 81). These patients had 274 fractures. The dominant extremity was more frequently involved (60 percent). Forty-eight percent of patients had both bones fractured, 31 percent had their radius fractured and 21 percent had only their ulna fractured. In 28 patients the fracture was open. There were 10 Galeazzi and 9 Monteggia fractures.

Results: Fractures healed after an average time of 9.5 weeks. One hundred thirty-two patients stated that they were satisfied by their outcome. At the final follow up, according to DASH score, the outcome was excellent (<5) in patients. Patients with an open fracture, a Galeazzi fracture-dislocation and a Monteggia fracture-dislocation had a lower DASH score with a mean of 15. Complications included soft tissue infection that required intravenous antibiotics in nine patients, osteomyelitis that required repeated debridement and finally bone grafting in two patients, complex regional pain syndrome in eight patients and radioulnar synostosis in two patients.

Conclusions: Outcome after operative management of forearm fractures is very satisfactory. Open fractures and fracture-dislocations have a less satisfactory outcome. Complications after operative management may occur. If recognized and treated early, they will not compromise the outcome.

A-0236 CLINICAL AND RADIOLOGICAL OUTCOMES OF COMPUTER-ASSISTED CORRECTIVE OSTEOTOMIES WITH PATIENT-SPECIFIC GUIDES IN MADELUNG DEFORMITY

Christina Wanivenhaus, Mauro Maniglio, Andreas Weber, Lisa Reissner, Andreas Schweizer
Balgrist University Hospital, Zurich, Switzerland

Introduction: Madelung deformity (MD) is a rare wrist growth disorder characterized by premature closure of the volar-ulnar aspect of the distal radial growth plate, leading to distinctive deformities. For patients with limited remaining growth potential and established deformity, corrective osteotomies are performed to improve function and reduce pain. Clear evidence-based guidelines for routine treatments are lacking.

Computer-assisted corrective osteotomies, utilizing 3D preoperative planning and patient-specific guides, provide a promising approach for precise reconstruction. This study aims to assess the clinical and radiological outcomes of this technique in patients with MD

Material & Methods: This retrospective analysis included patients treated at our clinic between 2013 and 2023 who underwent computer-assisted corrective osteotomies using 3D preoperative planning software (CASPA) for deformity analysis and correction planning, and execution of the correction facilitating patient-specific intraoperative guides (myosteotomy, medacta). At the final follow-up, conducted at least one year postoperatively, patients underwent comprehensive clinical and sonographic evaluations. Patient-reported outcome measures were collected, including the Patient-Rated Wrist Evaluation (PRWE), Disabilities of the Arm, Shoulder and Hand (DASH) score, Visual Analog Scale (VAS) for pain at rest and during activity, and the Single Assessment Numeric Evaluation (SANE). Clinical assessments included active range of motion (ROM) and grip strength. The stability of the distal radioulnar joint (DRUJ) was evaluated pre- and postoperatively.

Results: Ten patients (all female) with Madelung deformity underwent computer-assisted corrective osteotomies using patient-specific guides. The median age at the time of surgery was 17 years (range 13-32 years) with a median follow-up (FU) period of 3,6 years (range 1,6 – 10,7 years).

At the final FU the median PRWE total score was 9.5, with an interquartile range (IQR) of 36.3. For the DASH Score, the median was 8.6, with an IQR of 32.6. The SANE scores showed a statistically significant improvement ($p = 0.002$). The median preoperative SANE score was 40.0 (IQR: 5.0), which increased to a median of 87.5 (IQR: 16.25) at follow-up. Grip strength on the operated side improved significantly, with a preoperative mean of 13.1 ± 9.4 kg and a postoperative mean of $23.1 \pm 8,7$ kg ($p = 0.005$).

Four cases demonstrated an improvement from DRUJ instability to stability, with no cases showing a decline from stability to instability

Conclusions: Computer-assisted corrective osteotomies using 3D preoperative planning and patient-specific guides offer an effective approach for the treatment of established MD. Statistically significant gains were observed in SANE scores, indicating increased patient satisfaction.

Compared to conventional techniques, the major advantage of the 3D-planned approach is the ability to intraoperatively adjust the definitive length while maintaining angulation correction through the guide. This allows for precise fine-tuning of DRUJ congruence during surgery.

A-0237 REVOLUTIONIZING HAND SURGERY: THE ROLE OF AI AND VR IN DIAGNOSTICS, TRAINING, AND REHABILITATION

Malek Benamor[1], Alexandru Amarandei[1], Stefana Luca[1,2], Dan Cristian Moraru[1,2], Mihaela Pertea[1,2]
[1]Department of Plastic Surgery and Reconstructive Microsurgery, Sf Spiridon, Emergency County, Hospital Iasi, Romania;
[2]Grigore T Popa University of Medicine and Pharmacy, Iasi, Romania

Introduction: The integration of Artificial Intelligence (AI) and Virtual Reality (VR) in hand surgery offers a huge potential for improving preoperative planning, surgical performance, and post-operative rehabilitation. While AI is being primarily used for diagnostic and predictive analytics, VR is being used as a tool for surgical simulation and patient recovery based on the studies reported in the literature

Aim: This study aims to evaluate the effectiveness and clinical impact of AI and VR technologies in hand surgery, focusing on surgical precision, training enhancement, and rehabilitation outcomes. The study also seeks to identify potential challenges and barriers to implementation

Material & Methods: A systematic review of studies published from 2010 to 2024 was performed using the MESH terms (AI , VR , HAND SURGERY , MICROSURGERY) focusing on clinical trials, case studies, and meta-analyses that investigated AI and VR applications in hand surgery. Specific areas of focus included AI-assisted diagnostic tools (such as image recognition for fractures and deformities), VR-based surgical training simulators, and VR-assisted rehabilitation programs. Data was collected on patient outcomes, surgeon satisfaction, training effectiveness, and post-surgical recovery metrics

Results: A total of 12 articles were identified in the review, published between 2010 and 2024 . The studies covered various applications of Artificial Intelligence (AI) and Virtual Reality (VR) in hand surgery, with the following key areas of focus: AI for diagnostic purposes, VR for surgical training, VR for rehabilitation

AI Applications: AI-enhanced imaging and diagnostics have improved fracture detection and tissue classification in hand surgery. A meta-analysis of AI diagnostic tools demonstrated an accuracy rate of 90% in identifying fractures from X-ray and CT scan data, compared to 75% for traditional methods. Additionally, AI algorithms have been used to predict post-surgical recovery, with predictive models showing an 85% success rate in forecasting complications and rehabilitation time.

VR Surgical Training: VR surgical simulators have been shown to significantly enhance the training of hand surgeons. In a cohort study, VR training programs reduced error rates in simulated procedures by 30% compared to traditional training methods. Surgeons who underwent VR simulation training also demonstrated faster adaptation during real surgeries, with a 20% reduction in operation time for complex procedures. Feedback from participants indicated higher confidence levels, with 95% reporting improved procedural knowledge.

VR in Rehabilitation: Post-operative VR rehabilitation programs were associated with faster recovery times and improved functional outcomes in hand surgery patients. A randomized controlled trial revealed that patients using VR rehabilitation showed a 40% improvement in hand function (measured by the Disabilities of the Arm, Shoulder, and Hand (DASH) score) compared to those undergoing conventional rehabilitation. Additionally, VR therapy was well-received, with 90% of patients reporting high satisfaction levels

Conclusions: AI and VR technologies are proving valuable in improving diagnostic precision, enhancing surgical training, and accelerating rehabilitation in hand surgery. While challenges like cost and standardization remain, these technologies hold significant promise for improving clinical outcomes and patient care.

A-0238 VASCULARIZED PERIOSTEAL FLAP OF THE FIRST METACARPAL USING ARTHROSCOPIC TECHNIQUE

Paula Serrano Chinchilla, Marcos Cruz Sánchez
Hospital Dos de Maig, Barcelona, Spain

Introduction: Scaphoid fracture is the most common carpal fracture (60-70%), reaching nonunion rates of 15%. The treatment of scaphoid pseudarthrosis ranges from less invasive options such as arthroscopy-assisted focus refreshing and autografting, to more invasive options such as vascularized grafts. Although the latter achieve a greater biological contribution, they imply morbidity of the donor area and having to perform an open approach to the fracture, with exposure and surgical injury of adjacent tissues

Aim: To present two cases of arthroscopic treatment of scaphoid nonunion with periosteal flap of the first metacarpal

Material & Methods: First case: 36-year-old man in the 10th month after scaphoid middle third fracture, with loss of signal on magnetic resonance imaging suggestive of onset of necrosis of the proximal end.

Second case: 32-year-old male with scaphoid fracture of 6 years of evolution, with images of sclerosis and bone cysts at the margins.

Surgical technique: first arthroscopic stage to assess lesions and extensive curettage of the nonunion focus. Reduction, temporary fixation with 2 Kirschner wires and screw placement. Distal radius cancellous autograft obtained through minimal radial approach. Graft insertion through radial midcarpal portal.

Longitudinal approach to the first metacarpal, obtaining a periosteal flap of about 1.5x3.5cm, with a pedicle in the trapeziometacarpal region at the expense of branches of the dorsal artery of the 1st metacarpal. Tunneling of the path from the base of the pedicle to portal 3-4 using a mosquito. Rotation of the flap by approximately 90º and passage through the tunnel using a distal traction point, and fixation using a 1.1mm anchor

Results: First case: at the 8th postoperatively month, consolidation of the fracture, complete joint balance and usual activities without pain is observed.

Second case: At 4 months he presented advanced consolidation, complete joint balance and resolution of pain

Conclusions: Although the cases are limited, the arthroscopic vascularized periosteal flap technique of the first metacarpal has shown good results in terms of consolidation and function, with limited morbidity of the donor area, good wrist mobility and avoiding the devascularization inherent to an open approach of the scaphoid.

A-0239 REVOLUTIONIZING CHRONIC CMC-I ARTHROPLASTY INFECTIONS: A TWO-STAGE SURGICAL BREAKTHROUGH

Kira Vande Voorde[1], Arne Decramer[2], Edward Van Clooster[1], Bert Vanmierlo[3]
[1]Department of Orthopaedic and Trauma Surgery, AZ Delta, Roeselare, Belgium; [2]Department of Orthopaedic and Trauma Surgery, AZ Delta Roeselare, Roeselare, Belgium; [2]Department of Development and Regeneration, KU Leuven-Leuven University, Leuven, Belgium; [3]Department of Orthopaedic and Trauma Surgery, AZ Delta Roeselare, Roeselare, Belgium; [3]Department of Cardio and Organ Systems, Hasselt University, Hasselt, Belgium

Introduction: Thumb base arthroplasty is a widely accepted solution for the treatment of osteoarthritis of the thumb's carpometacarpal joint (CMC-I). Despite its efficacy, this procedure, like other arthroplasties, carries a risk of infection. The diagnosis of infection remains challenging, and an established gold standard for treatment has yet to be determined. Inspired by the staged approach commonly used for chronic hip and knee arthroplasty infections, we adapted and applied a two-stage revision procedure to addres chronic CMC-I prosthesis infections

Material & Methods: A 48-year-old patient presented with persistent pain and impaired functionality one year following a surgical revision for a luxating CMC-I joint prosthesis.

X-rays revealed osteolysis around the cup and stem. A subsequent SPECT-CT scan demonstrated elevated activity in these areas. To differentiate potential causes, a joint aspiration was performed, revealing purulent fluid with elevated leukocytosis, though there was insufficient fluid for microbiological analysis. These findings strongly suggested the presence of a chronic infection."
The first stage consisted of removal of the arthroplasty, extensive debridement of nonviable tissue, synovectomy, and irrigation. An antibiotic-impregnated cement spacer was inserted, followed by antibiotics tailored to the infecting organism. The second stage involved removing the spacer, repeating irrigation and debridement, and final reconstruction with revision components
Results: The two-stage revision procedure was successfully performed on a patient with a chronic CMC-I arthroplasty infection, resulting in significant improvement in clinical symptoms and functional outcome, as well as normalization of inflammatory parameters. No infection recurrence was observed during the 2-year follow-up period
Conclusions: This two-stage revision procedure presents a promising approach for managing chronic infections in CMC-I arthroplasties. By employing a methodology similar to that used in hip and knee arthroplasties, we provide a new perspective on treating this challenging condition, resulting in preserved joint function while effectively controlling the infection. Further studies and long-term follow-up are necessary to validate the applicability and effectiveness of this approach in broader clinical practice.

A-0240 RESULTS OF INTRAMEDULLARY NAILING FOR THE TREATMENT OF DISTAL EXTRA-ARTICULAR RADIUS FRACTURES AT ONE-YEAR FOLLOW-UP

Mauro Maniglio, Lea Estermann, Lisa Reissner, Ladislav Nagy, Andreas Schweizer
Department of Hand Surgery; The Balgrist, University Clinic, Zürich, Switzerland, Forchstrasse 340, CH-8008 Zürich; Switzerland, Telephone: +41 44 386 11 11, Email: maniglio.mauro@gmail.comAim: To evaluate the results of a minimally invasive intramedullary implant, the DRIM-Nail (= Distal Radius Intra Medullary-Nail) for the treatment of displaced, unstable extra-articular distal radius fractures. The results of our first eleven cases will be presented and compared to a matched group of patients treated with volar locking plates.

Patients and Methods: The DRIM nail is inserted through a 2-3 cm incision just proximal to the radial styloid and a 6mm drill hole between the 1st & 2nd extensor tendon compartment. Through the same exposure the nail is locked with 4 screws, 2 in the distal and other 2 in the proximal fragment. Our first 11 patients (9 female; mean age 51y, 25-76y) treated with the DRIM nail were assessed preoperatively, 2 and 6 weeks, 3 and 6 months postoperatively. Pain level, range of motion and grip strength were assessed. In addition, palmar tilt and radial inclination and ulnar variance were measured in posteroanterior and lateral radiographs. For comparison 10 patients treated with volar locking plates with identical postoperative regimen matched for age, fracture pattern and follow-up were used.
Results: At six months in the DRIM-group the mean pain level was 0.4 (on a scale 0-5) active flexion/extension was 70° (45-90°, 92% to opposite side) / 73° (60-85°, 98%); radial/ulnar deviation 16°(5-30°, 84%) / 32°(20-40°, 87%) and pro / supination 78°(70-90°, 99%) / 82° (70-90°, 99%) and grip strength 24kg (20-50kg, 90%). The mean palmar tilt was 8° and the radial inclination 24° and the ulnar variance +0.5mm. This was unchanged compared to immediate postoperatively. In the control group the mean pain level was 1.3, active flexion/extension was 64° (82%) / 57° (74%); radial/ulnar deviation 18°(61%) / 33°(71%) and pro /supination 81°(97%) / 76° (89%) and grip strength 26kg (78%).
The comparison of the postoperative evolution showed less pain, faster recovery of strength and better final motion. At the meeting we will update our results and be able to report the 1 year follow-up.

Conclusion: The DRIM nail proved to maintain the reduced position during the functional postop. treatment until uneventful consolidation. The final clinical results were at least as good as after volar plating, but the postoperative rehabilitation was more rapid and less painful. These results are very encouraging.

A-0242 RECONSTRUCTION OF SEGMENTAL DEFECT OF FLEXOR TENDONS OF THE WRIST AND HAND USING EXTENSOR DIGITORUM LONGUS TENDON

Justin Wormald, Claire Sethu, Nakul Kain, Sarah Tucker
John Radcliffe Hospital, Oxford, UK

Introduction: We present the case of a young man with segmental division of all of his flexor tendons, ulnar nerve, median nerve, radial and ulnar artery of the left forearm following an episode of psychosis induced deliberate self harm. Reconstruction involved using the extensor digitorum longus (EDL) tendon in its entirety, sural nerve cable grafting, vein grafting and an anterolateral thigh (ALT) flap for soft tissue reconstruction. This case highlights the use of the extensor digitorum longus tendon as an excellent reconstructive option when multiple tendons have been divided with minimal donor site morbidity.

Case History: A 31 year old gentleman presented with deliberate self harm wounds to the volar aspect of his left forearm. Following initial debridement he was noted to have segmental loss of approximately 15cm of all long flexor tendons of the wrist and hand as well as segmental loss of radial artery, ulnar artery, median nerve and ulnar nerve. His hand was perfused throughout. In addition, he had a soft tissue loss of 20x10cm. Pre operative US did not demonstrate a plantaris tendon in either leg.

The EDL tendon was chosen to reconstruct the flexor tendon defects due to to length of tendon graft that could be obtained. A 3 team approach was organised: 1. Harvest of EDL, sural nerve, and short saphenous vein 2. Harvest of ALT flap 3. Reconstruction of left forearm.

In the immediate post operative phase, the patient recovered well with no complications. 6 months postoperative, the patient had returned to driving and boxing activities with improving intrinsic function.

Conclusion: In conclusion, we would like to highlight the use of the extensor digitorum longus tendon as an excellent tendon reconstructive option. In addition, the entire tendon can be harvested with minimal donor site morbidity. The second point we would like to highlight is the training opportunities that such a case can provide. The team comprised of 3 consultants, 1 fellow, 5 registrars and 1 senior house officer. This allowed multiple training opportunities in a supervised setting in all key aspects of this complex reconstruction.

A-0243 PALMARIS LONGUS TENDON TRANSFER IN THUMB HYPOPLASIA: VALIDATION OF A NEW TECHNIQUE VIA TGAP SCORE

Elisa Rosanda[1], Chiara Parolo[1], Riccardo Fondrini[2], Giorgio Pajardi[1]
[1]Department of Hand Surgery and Rehabilitation, S. Giuseppe Hospital IRCCS MultiMedica, Milan University, Milan, Italy; [2]UNIMI BIOMETRA: Universita degli Studi di Milano Dipartimento di Biotecnologie Mediche e Medicina Traslazionale Milano, Italy

Introduction: Thumb hypoplasia represents a congenital hand difference with a wide spectrum of clinical presentations, each corresponding to different therapeutic options. In cases IIIb, IV, and V according to Blauth's classification, the low functionality or absence of the thumb unequivocally requires pollicization of the closest radial element or toe transfer.

In cases II and IIIa, where there is a hypoplastic but still functional thumb with adequate grasping ability, surgeons tend to enhance or correct the existing structure to optimize grip and pinch functions
Aim: To evaluate the outcomes of our new technique focused on enhancing thumb stability and opposition without sacrificing the palmar aponeurosis. Our technique indeed spares the palmaris fascia in constrast with Kamitz procedure
Material & Methods: We present the case of a 4-year-old girl with type IIIa thumb hypoplasia, treated for laxity of the radial collateral ligament (RCL) and instability during thumb opposition. The child demonstrated the ability to oppose her thumb, making the sacrifice of the abductor digiti minimi unnecessary. Therefore, we opted for a palmaris gracilis tendon transfer. To our knowledge, this is the first reported use of a palmaris gracilis transfer for this purpose. Following a rigorous rehabilitation protocol, thumb functionality was assessed using the TGAP score at 2 and 5 months postoperatively
Results: Postoperative clinical evaluations revealed adequate stability and pronation of the thumb, along with improved grip and pinch function as indicated by the TGAP score
Conclusions: The use of the palmaris gracilis in thumb hypoplasia for RCL retensioning and thumb repositioning has proven effective in both static and dynamic tests. Further studies are needed to evaluate its long-term efficacy.

A-0244 ULNAR POLYDACTYLY: PHENOTYPES, ETHNIC VARIATION, AND ASSOCIATED ANOMALIES IN A PROSPECTIVE REGISTRY STUDY OF 100 PATIENTS

Elias Tallay, Ishanee Nirmalanathan, Mona Irene Winge, Ida Neergård Sletten
Division of Orthopaedic Surgery, Oslo University Hospital, Oslo, Norway

Introduction: Polydactyly is the most common congenital upper limb anomaly (CULA). Ulnar polydactyly (OMT IB2vi) is the predominant subtype, classified according to Temtamy and McKusick as type A (more or less fully developed 6th ray) or type B (rudimentary, pediculated finger). Type A is treated with surgical reconstruction, including transfer of collateral ligaments and extensor tendons from the 6th to the 5th finger. The more common type B is treated with a simple excision. Despite its high prevalence, data on family history, associated anomalies, and ethnic distribution remain sparse
Aim: This retrospective registry study aimed to analyse the distribution of ulnar polydactyly subtypes and examine parental, ethnic, and familial background data at Oslo University Hospital
Material & Methods: We analysed prospectively collected data from our CULA North Oslo Registry for all patients with ulnar polydactyly treated in our unit between May 2018 and August 2024
Results: We identified 100 patients and 167 hands with ulnar polydactyly. Type B accounted for 151 hands (90%), and Type A 16 hands (9.6%). Sixty-one (91%) of the 67 patients with bilateral involvement had an identical phenotype. Among these, 58/61 (95%) patients had bilateral Type B and three (4.9%) had Type A. Twenty-seven patients had left-sided unilateral ulnar polydactyly, of which 26 (96%) hands were classified as Type B, and 1 (3.7%) as Type A. Six patients had right-sided unilateral ulnar polydactyly, evenly split between both types.
Lower limb anomalies were found in 24/100 (24%) patients, with lateral polydactyly in 20 (83%) of these cases. Organ anomalies or dysfunctions were recorded in 7/100 (7%) patients, all with bilateral ulnar polydactyly (five type B and two type A). Three of these patients had cardiac anomalies. Seven patients were diagnosed with a known syndrome, six of whom had bilateral ulnar polydactyly (five type B and one type A).
Ethnic data and family history were available for 87/100 (87%) patients, of which forty-eight (55%) were of non-Nordic origin, and 39 (45%) had two parents of Nordic origin. Forty-three (49%) patients had a positive family history for congenital anomalies (of any type), and 34 (39%) had a family member with an ulnar polydactyly.
From the age of one, we reconstructed all 16 type A ulnar polydactylies under general anaesthesia. Of 151 type B, six had

already been treated prior to an out-patient consultation in our clinic. The remaining 145 digits were excised in our clinic, most in local anaesthesia, within the first weeks after birth. No complications to surgery were reported
Conclusions: Left-sided type B was the most common subtype, and two-thirds of the patients had a bilateral involvement. The prevalence was higher among individuals of non-Nordic origin. We found a high degree of heredity, and associated lateral polydactyly in the feet. Surgical excision was safe without complications or the need for secondary procedures.

A-0245 NEUROGENESIS IMPERFECTA: FETAL SUSCEPTIBILITY TO BRACHIAL PLEXUS BIRTH INJURY IS ASSOCIATED WITH PRENATALLY IDENTIFIABLE GENETIC VARIATION IN AXON STRUCTURE AND DEVELOPMENT

Roger Cornwall, Simon Sharples, Steven Crone, Kritton Shay-Winkler, Qingnian Goh
Cincinnati Children's Hospital Medical Center, Cincinnati, OH, USA

Introduction: Brachial plexus birth injury (BPBI) is the most common cause of childhood upper limb paralysis, leading to permanent sequelae in 20-40% of affected children. As a traumatic, delivery-related injury, BPBI can be largely prevented by Cesarean section as long as BPBI risk can be accurately predicted prenatally. Unfortunately, such prediction is severely limited, with known prenatal risk factors present in fewer than 50% of BPBI cases. Indeed, even among high risk pregnancies, 48 C-sections must be performed to prevent one BPBI. Therefore, additional predictive factors must be identified to aid in injury prediction and prevention. Several recent studies in different populations have found BPBI incidence varying across ancestral groups, controlling for socioeconomic and health-related factors. It is possible that genetic variation predisposes to injury, although this possibility remains unexplored
Aim: The current study uses a genome-wide and phenome-wide association study (GWAS/PheWAS) approach to test the hypothesis that fetal genetic variation, potentially in neuron fragility, is associated with susceptibility to BPBI
Material & Methods: Using the Finnish biobank, FinnGen, BPBI cases and controls were compared to identify genetic variants associated with BPBI. Corresponding genes were analyzed by ToppGene gene ontology to elucidate enriched cellular components and biological processes. Lead variants with allele frequencies >1% in gnomAD and AllofUs datasets were further analyzed by (1) correlations between allele frequencies and published BPBI incidences across ancestral groups, (2) PheWAS analysis to identify significantly associated phenotypes, and (3) cell-specific expression analysis of corresponding genes using SeqSeek
Results: Ninety-five cases of BPBI were compared to 453,540 controls, revealing 208 variants in 152 known genes associated with BPBI at $p<5x10-5$. Gene ontology analysis found significantly enriched cellular components and biological processes predominantly involving neuron/axon structure and development. Among the lead variants, only the top variant, in an enhancer for the gene TIAM1, has a worldwide allele frequency >1%. The frequency of this variant allele directly correlates with published BPBI incidences across ancestral groups, both worldwide and in the USA. In PheWAS analysis, this TIAM1 variant is significantly associated only with BPBI. Expression of TIAM1 was found to be enriched perinatally in motor neurons in the cervical spinal cord
Conclusions: Variants in genes governing neuron/axon structural integrity are associated with BPBI, suggesting that prenatally identifiable genetic variation in fetal axon strength may underlie BPBI susceptibility. Furthermore, a promising lead variant was identified in the TIAM1 gene, matching the incidence, perinatal timing, and largely motor axonotmesis phenotype of BPBI. Based on these preliminary findings, ongoing work in additional populations and mechanistic experiments aims to elucidate the polygenic/monogenic risk for BPBI that could be identified prenatally and incorporated with clinical risk factors to predict individual BPBI susceptibility and guide preventative obstetrical measures. Overall, the discovery of fetal genetic susceptibility to BPBI introduces the concept of "neurogenesis imperfecta", representing a novel nerve injury paradigm and potentially heralding an unprecedented opportunity to predict and prevent this disabling injury.

A-0246 TENDON TRANSFERS FOR THE PARALYZED UPPER EXTREMITY

Theodoros Mylonas, Eleftheria P Adaktylidou, Alexandros Koskiniotis, Zoe Dailiana, Konstantinos Malizos, Sokratis E. Varitimidis
Department of Orthopaedics and Musculoskeletal Trauma, University of Thessaly, Larissa, Greece

Introduction: Tendon transfers are widely employed in hand surgery to restore function in patients with nerve damage, muscle paralysis, or trauma. By redirecting functional tendons to replace the action of non-functional muscles, these transfers can significantly improve grip, pinch, and fine motor control. Despite their frequent use, outcome variability and patient-specific factors influencing success are not fully understood

Aim: This study aims to retrospectively evaluate the clinical outcomes of tendon transfers in the hand, identifying factors that contribute to successful restoration of hand function and the incidence of complications

Material & Methods: A retrospective review was conducted on 120 patients who underwent tendon transfer surgery for hand reconstruction between 2003 and 2024. Patient demographics, indication for surgery, type of tendon transfer, and follow-up duration were collected. Functional outcomes were assessed using grip strength, pinch strength, and the Quick Disabilities of the Arm, Shoulder, and Hand (qDASH) score. Complications such as tendon rupture, infection, and reoperation were also recorded

Results: Of the 120 patients included in the study, 54% were male and the rest of them female, with a mean age of 38.4 years (6-70) during the surgery, whereas the mean time of the follow up was 12.3 years (2-20). The underlying pathology that led to tendon transfers of the hand was cerebral palsy in 44 patients (36,3%), spinal cord injury in 12 patients (9.9%), neglected carpal tunnel syndrome with thenar muscles atrophy in 17 patients (13.7%), Holstein Lewis fracture with radial nerve palsy in 19 patients (15.7%), spontaneous rupture of extensor pollicis longus tendon in 6 patients (4.9%), laceration injuries with nerve involvement in 12 patients (19%). Eighty-two percent of the patients declared satisfied with the final result regarding hand function. The average grip strength of the injured hand was 72% of the one measured to the healthy hand and pinch strength 77% compared to the contralateral hand. The mean qDASH score was 15.2 at the final follow up. The most common complications included tendon adhesion and limited range of motion, occurring in 19% of patients, while 6% required revision surgery

Conclusions: Tendon transfers are effective in restoring hand function, particularly in patients with nerve palsies and muscle paralysis. Outcomes were largely positive, though complications such as adhesions and reoperations also existed, depending on the complexity of each case. Early intervention and tailored rehabilitation are critical for optimizing functional recovery. Further studies are needed to refine surgical techniques and improve patient selection criteria.

A-0247 THE LONG TERM OUTCOMES OF THE USE OF THE MODIFIED PANEVA-HOLEVICH TECHNIQUE FOR THE RECONSTRUCTION OF INJURED FLEXOR TENDONS

Theodoros Mylonas, Eleftheria P Adaktylidou, Alexandros Koskiniotis, Efstathios Konstantinou, Efstratios Athanaselis, Nikolaos Stefanou, Zoe Dailiana, Sokratis E. Varitimidis
Department of Orthopaedics and Musculoskeletal Trauma, University of Thessaly, Larissa, Greece

Introduction: Reconstructing a neglected and scarred flexor tendon system in zone II of the hand remains a significant challenge for hand surgeons. Usually, young, working patients are those suffering from misdiagnosed or mistreated flexor tendons lacerations and looking for improvement of their digit's range of motion and hand's functionality

Aim: The aim of the current study was to investigate the outcomes of the modified Paneva-Holevich technique in the

management of neglected injuries of both flexor tendons of a single digit in a tertiary university orthopaedic department in Greece

Material & Methods: A retrospective analysis of 14 patients with neglected (>6 weeks) laceration of both flexor tendons in zone II or a failed primary repair was conducted. All patients had a single digit involvement with apparent flexion inability of both PIP and DIP. They underwent a two-stage modified Paneva Holevich reconstruction, a combined method of the Paneva-Holevich technique and Hunter's technique as described by Kessler in 1972. The preoperative status of the involved digit was classified according to the Boyes and Stark classification system and all patients had intensive physiotherapy before surgery in order to gain as much as possible passive ROM. At the final follow up the passive and active ROM of the injured digit was measured along with the grip strength using a Jamar dynamometer. Finally the qDASH score was recorded

Results: 14 patients were include in this study between 2010 and 2023, 9 male patients (64%) and 5 female (36%) and the mean age was 37.5 years (20-67). All patients had a single digit involvement in Zone II of flexor tendons. The index finger was involved in 9 patients, ring finger in 3 patients and the thumb in 2 patients. In 10 cases the initial injury was misdiagnosed and left untreated in the initial evaluation and in 4 patients the primary repair of the tendons failed. The mean time between the initial injury and the final management with the first stage of the modified Paneva Holevich technique was 7 months. According to the Boyes classification system 8 digits were classified as Grade III, 4 patients Grade II and 2 patients Grafe IV. The mean follow up was 7.5 years and at the final follow up the mean grip strength was 77% compared to the contralateral hand, the mean total active flexion of the affected digit was 180^{o} with an extension deficit of 18^{o} in the DIP. The mean qDASH score was 10. All patients returned to their previous level of function and only one patient had a failed reconstruction

Conclusions: The two-stage technique is a valuable and effective method for reconstructing a scarred flexor tendon system in zone II of the hand, achieving a high rate of excellent and good outcomes with minimal complications.

A-0248 EVALUATING THE ROLE OF SPLINTS IN NON-OPERATIVE MANAGEMENT OF BASAL THUMB ARTHRITIS: A SYSTEMATIC REVIEW OF RCTS

Alexandros Koskiniotis, Eleftheria P Adaktylidou, Efstathios Konstantinou, Ioannis Nastas, Efstratios Athanaselis, Nikolaos Stefanou, Sokratis E. Varitimidis

University Hospital of Larissa - Orthopaedic Department, University of Thessaly

Introduction: Osteoarthritis of the first carpometacarpal (CMC) joint commonly leads to pain, swelling, reduced hand function, impaired pinch strength, and joint instability. Splints may help alleviate symptoms of basal arthritis by stabilizing the joint in a functional position and protecting inflamed tissues

Aim: This study aimed to assess the effectiveness of splints in managing symptoms of basal thumb osteoarthritis and to evaluate the impact of different types of splints on joint function and pain relief

Material & Methods: A systematic review of the literature was conducted following PRISMA guidelines, including all randomized controlled trials (RCTs) from 2000 to 2024 that examined short-term outcomes of splint use for basal thumb osteoarthritis

Results: A total of 10 RCTs were reviewed, including 821 cases of arthritic thumbs. All studies demonstrated significant symptom improvement with splint use. One study found no additional benefit when a brace was used in combination with a physiotherapy and exercise protocol over an 8-week period. In another study, patients reported improved pain relief and functionality with a brace when performing daily activities, though not in general terms. No significant differences were observed between different types of splints (e.g., short or long, custom-made or prefabricated) at final follow-up

across studies. Patients showed a slight preference for shorter splints in their daily activities in 2 trials
Conclusions: Splints appear to provide symptom relief and improved functionality in daily activities for individuals with first CMC joint osteoarthritis, with similar outcomes observed across different splint types.

A-0249 A CASE SERIES OF SURGICALLY TREATED POST-TRAUMATIC RADIOULNAR SYNOSTOSIS

Alexandros Koskiniotis, Theodoros Mylonas, Eleftheria P Adaktylidou, Aikaterini Sourmenidi, Nikolaos Stefanou, Efstratios Athanaselis, Sokratis E. Varitimidis
University Hospital of Larissa - Orthopaedic Department, University of Thessaly

Introduction: Post-traumatic radioulnar synostosis is a rare and disabling condition that can severely impair upper limb function necessitating surgical intervention to restore mobility. However, outcomes and recurrence rates remain inconsistent across studies, with only a limited number of case series reported in the literature
Aim: This study aimed to present the clinical outcomes of surgically treated patients with post-traumatic radioulnar synostosis at a tertiary university hospital in Greece
Material & Methods: Nine patients treated at our institution from 2010 to 2024 were included. Preoperative imaging included radiographs and, in some cases, computed tomography (CT) scans. Outcomes were assessed pre- and postoperatively using the Mayo Elbow Performance Score (MEPS) and the QuickDASH score
Results: The average follow-up period was 22.3 months. Postoperative evaluations showed significant improvements, with substantial gains in both the Mayo Elbow Performance Score ($P = .0001$) and the QuickDASH score ($P = .002$). Final mean ranges of motion included an arc of 110° in extension-flexion and 119° in pronation-supination. No recurrences of synostosis were observed during the follow-up period
Conclusions: Surgical management of post-traumatic radioulnar synostosis appears to be an effective approach with low recurrence rates when performed by skilled upper limb surgeons. However, thorough preoperative planning is essential in order to optimize outcomes.

A-0250 THE TREATMENT OF BONY MALLET FINGER AIMED AT EARLY RETURN TO SPORT OR MANUAL WORK

Ryotaro Fujitani[1] , Shohei Omokawa[2]
[1]Ishinkai Yao General Hospital, Osaka; [2]Nara medical University, Nara

Introduction: In 1988, Ishigro et al. propsosed closed reduction and K-wire blocking for bony mallet finger. This procedure is an excellent minimally invasive surgery, but it has some inconveniences in ADL, such as the possibility of infection and activity limit due to the wire protruding above the skin for several weeks. It imposes significant restrictions, especially on athletes and patients who do heavy labor that gets their hands dirty.
Aim: We treat patients with subcutaneously buried DIP joint temporary fixation pins (D pins) + micro screws (MS) fixation, aiming for early return to sports and work, and we investigated the postoperative clinical outcomes
Material & Methods: There were 16 cases (12 males, 4 females, average age 37.7 years). The cause of injury was sports in 7 cases and work-related trauma in 9 cases.
Operative method: An extension block pin (E pin) was inserted into the middle phalanx according to the Ishiguro method, the bone fragment was percutaneously repositioned, and the DIP joint was provisionally fixed with a D pin from the tip of the finger. A small skin incision of about 2 mm was made from the dorsal midline with a sharp blade knife, the bone

fragment was internally fixed with MS, and the incision was fixed with tape. The E pin was removed before returning to sports or current work.
Results: The follow-up period was 10 weeks, and all cases achieved bone union. The return to sports was 2 weeks, and the return to current work was 1 week. The E pin was removed at an average of 1.5 weeks, and the D pin was removed at an average of about 4.4 weeks. Three cases had a joint surface step of 0.5 mm or more after surgery. The range of motion of the DIP joint at the final joint was an average of -7.8° in extension and 50.6° in flexion, and Crawford's evaluation method was excellent in 8 cases, good in 4 cases, fair in 2 cases. There were no complications such as pin breakage.
Discussion: In this study, we performed reduction and fixation using the Ishiguro method, and we buried a DIP joint temporary fixation pin subcutaneously for 4.4 weeks to increase the fixation force. In addition, we fixed the bone fragments with a micro screw, aiming for early return to sports and work. Its features include a small skin incision that does not require skin sutures, hand washing is possible about 4 days after surgery, strong fixation, and low incidence of flexion contracture. As a result, there was some ROM restriction, but all patients achieved bone union, there were no complications such as pin breakage, and patients returned to sports in 2 weeks and to their current jobs in 1 week.
Conclusion: Although it will be necessary to increase the number of cases and the follow-up period in the future, this method may enable early return to sports and physical labor safely.

A-0251 RADIOLOGICAL EFFECTIVENESS OF FIXED-ANGLE C-ARM TOMOSYNTHESIS (FACT) IN ENSURING PROPER SCREW POSITION IN SCAPHOID FRACTURE MODELS

SeongJu Choi[1], Joonha Lee[2], Uk Hur[3], Yohan Lee[3,4]
[1]Department of Orthopedic Surgery, Eulji University; [2]Yeson Hospital; [3]Department of Orthopedic Surgery, SMG-SNU Boramae Hospital, Seoul, Republic of Korea; [4]Department of Orthopedic Surgery, Seoul National University College of Medicine, Seoul, Republic of Korea

Introduction: Using portable tomography devices in upper limb fracture is limited.
Aim: In this study, the authors introduce a newly developed portable tomography device (Fixed-angle C-arm tomosynthesis image; FACT) and report its effectiveness in ensuring proper screw placement and alignment for percutaneous screw fixation in the scaphoid waist fracture model.
Material & Methods: The following seven 7 wrist models were designed using radio-opaque synthetic bone (Synbone®). There were one scaphoid waist fracture model, 2 types of models with guide-pin inserted (proper v.s. deviated axis), and 4 types of models with screw inserted (proper axis with/without screw penetration and deviated axis with/without screw penetration). A total of 80 orthopedic surgeons participated in the study. Participants were provided with a fluoroscopy image or tomography image by FACT for each model and responded to the questions regarding the presence or absence of fractures, appropriateness of alignment, and joint penetration of the screw.
Results: 80 people, 40 orthopedic surgeons and 40 hand surgery subspecialists, participated in the study. Fracture detection rates were 92.5% by fluoroscopy and 100% by Tomography ($p=0.077$). For the guide-pin inserted model, the sensitivity of tomography to detect the correct axis of the guide-pin was significantly higher than that of fluoroscopy (92.5% v.s. 50.0%, $p<0.001$). For screw-inserted models, Tomography showed significantly higher specificity in the detection of joint penetration of screw than fluoroscopy (83.5% v.s. 65.0%, $p=0.017$).
Conclusions: FACT is useful in diagnosing fractures, determining the correct orientation of the implant, and detection of articular penetration of the screw while performing percutaneous screw fixation in scaphoid fracture models.

A-0252 STATIC EXTERNAL FIXATOR AND CONCOMITTANT K-WIRE FIXATION FOR PILON TYPE FRACTURE OF THE PROXIMAL INTERPHALANGEAL JOINT OF THE FINGER

SeongJu Choi[1], Uk Hur[2], Yohan Lee[2,3]
[1]Department of Orthopedic Surgery, Eulji University; [2]Department of Orthopedic Surgery, SMG-SNU Boramae Hospital, Seoul, Republic of Korea; [3]Department of Orthopedic Surgery, Seoul National University College of Medicine, Seoul, Republic of Korea

Hypothesis: Fracture-dislocation and pilon injuries of the proximal interphalangeal joints (PIPJ) continue to pose significant management challenges. In this study, we report clinical and radiographic outcomes of a pilon-type fracture-dislocation of the proximal interphalangeal joint of the finger using a static external fixator and concomitant K-wire fixations.
Methods: Static external fixator and K-wire fixations were applied for 6 pilon-type PIPJ fractures. The joints involved were 3rd PIPJ in 1 patient, 4th PIPJ in 3 patients, and 5th PIPJ in 2 patients. The mean age of the patients was 41.7 (range, 27 ~ 52), and the mean follow-up duration was 7.7 months (range, 4 - 12 months). All patients were clinically and radiologically assessed on an outpatient basis after being discharged
Results: At the final follow-up, the mean range of motion of PIP joints in flexion was 99.5° (flexion range, 85°–110°), the mean extension lag was 5.0° (extension range, 0°–15°), and the mean visual analog scale score was 0.7. On anterior-posterior and lateral radiographs, congruity of the joint was satisfactory and distal interphalangeal joint stiffness was found in one case.
Summary: We attained satisfactory clinical outcomes on the recovery of joint movement and joint congruity after treating PIP joint fracture-dislocation injury with multiple K-wire fixation using a static external fixator.

A-0253 WHY IT IS NECESSARY TO USE THE ENTIRE ROOT RATHER PARTIAL WHEN DOING CONTRALATERAL C7 NERVE TRANSFER

Kaiming Gao, Jie Lao, Xin Zhao
Huashan Hospital, Fudan University, Shanghai, China

Introduction: The contralateral C7 nerve transfer is one of the most useful procedures in treating total brachial plexus avulsion injury cases. Neuromorphological investigations showed that the total axonal count for cC7 averaged approximately 24000, which was much more than any of the recipient nerves. For this reason, some surgeons recommended using a partial cC7 nerve, but not the entire root, as the donor. However, the author believed that it is necessary to use the entire root as the donor and then the current study was conducted
Aim: To determine whether the entire root of cC7 root must be used when doing the contralateral C7 nerve transfer and to explain the reason.
Material & Methods: In the current study, 73 patients were included and they were divided into two groups. In group 1, cC7 was used to transferred to median nerve and in group 2, cC7 was transferred to two recipient nerves.\\r\\nIn the group 1, 51 patients were included in this part. There were three different ways to harvest cC7 root. Entire, three-fourth and half. In group 2, cC7 was used to transfer to 2 recipient nerves. 22 patients were included in this part. There were two different combinations of recipient nerves. Median nerve together with biceps branch and median nerve together with triceps branch
Results: In group 1, the entire cC7 group achieved significantly better recovery. So we powerfully emphasize using the entire root as the donor when doing cC7 nerve transfer.
In group 2, no significant differences in functional recovery of the median nerve were found if compared with the results

reported previously. Also no difference between the two groups in this study. So we conclude that the function of median nerve will not be impacted regardless of whether the cC7 nerve was used to repair one or multiple recipient nerves simultaneously. And no matter which nerve was chosen as an additional recipient nerve, the median nerve will achieve the similar functional recovery. If comparing our results with those of previous studies in which the biceps branch was the only target, no significant difference was found.

Thought this study, we also found something interesting and self-contradiction. Recovery of MN is not acceptable with partial cC7 transfer while MN can achieve good recovery with entire cC7 transfer to MN together with an additional nerve, in which situation, the donor for median nerve is almost equal to partial cC7 root transfer.

We suppose that the harvesting of the entire cC7 nerve root to be the donor might be the key factor of this procedure. Then we conduct an experimental research and the results confirmed the clinical outcome.

We guess that harvesting entire cC7 root would improve the post-operative cortical plasticity which significantly determines the recovery of the recipient nerves. The further research was then made and the results supported our conjecture

Conclusions: The entire cC7 root must be harvested no matter one or multiple recipient nerves are going to be repaired and cortical plasticity also matters besides the amount of nerve fibers.

A-0255 A COMPARISON BETWEEN APPLICATION OF THE PELNAC ARTIFICIAL DERMAL SUBSTITUTE AND CONVENTIONAL TECHNIQUES FOR COVERAGE OF THE SOFT TISSUE DEFECT IN SYNDACTYLY RELEASE: A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL

Yang Guo, Wen Tian, Liying Sun
Beijing Jishuitan Hospital, Beijing, China

Introduction: Our hypothesis is the use of Pelnac artificial dermal substitute without skin grafting for coverage of the soft tissue defect in syndactyly release surgery will provide promising results.

Aim: This study was a registered prospective, randomized, controlled trial. Our aim is to evaluate the clinical comes for Pelnac artificial dermal substitute without skin grafting for coverage of the soft tissue defect in syndactyly release surgery.

Material & Methods: From Jan 2022 to Dec 2023, 57 commissures (45 patients) were evenly randomised into one of the surgical group for syndactyly release as following: Pelnac Group, the application of Pelnac artificial dermal layer without skin graft; Graft Group , as Cronin's technique descried in ;Flap Group, by using Dorsal hexagon island flap.

Evaluated parameters at follow-up were grade of web creep, scar quality assessed by Vancouver Scar Scale (VSS), occurrence of secondary deformities of the separated fingers. A visual analogue scale (VAS) score from 0–10 for cosmesis of the affected web and donor site was completed by the patient's parent and a single surgeon.

Results: The average age of patients was 15.1 months (range, 12 months to 38 months) at the time of surgery, and the mean follow-up was 15 months (range 12-18). The mean tourniquet time was 98 minutes (range 66-135) for graft group, 75 minutes for Pelnac group (55-80) and 84 minutes (55-120) for flap group. The mean web creep score was 1.3 (0-3) for graft group ,1.5 (0-3) for Pelnac group and 1.8 (0-3) for Island group. The mean VSS was 1.5 (0-4) for graft group ,1.8 (0-5) for Pelnac grouop and 1.2 (0-3) for Island group.The mean parents' visual analogue scale for Pelnac grouop was 8.2 (6-9), 7.5 (5-9) for graft group and 8.8 (6-9) for flap group

Conclusions: The use of Pelnac artificial dermal substitute without skin grafting for coverage of the soft tissue defect in syndactyly release surgery provided promising results. This method is a simple and effective option for resurfacing of defects in commissure reconstruction surgery.

A-0256 IS THE SALVAGE PROCEDURE THE ONLY OPTION FOR SNAC II WRISTS?

Yang Guo, Li Zhuo
Beijing Jishuitan Hospital, Beijing, China

Introduction: Untreated scaphoid non-union will lead to painful wrist arthrosis eventually.Surgical intervention is then indicated if major functional impairment after conservative treatment fails. In clinical practice, there are always some patients are reluctant to have their scaphoid removed and undergo salvage procedure. Surgeons debate when the procedures to gain union are favored over salvage procedures
Aim: The aim of our study is evaluate whether the good mid-term results reported from scaphoid nonunion with established arthrosis treated by scaphoid reconstruction could be expected.
Material & Methods: All patients operated with scaphoid reconstruction due to SNAC wrist arthrosis were identified in the hospital data register and operation protocols during 2013–2018. 21 patients with 21 (18 dominant) wrists, were operated due to pain and radiological degeneration beyond stage II (vender). In the 18 patients a preoperative CT scan was also obtained. 25 (71%) were male and the mean age at surgery was 51 (22–71) years. Prior to the surgery, 3 wrists had been operated at least once for fracture fixation surgery. The preoperative radiological grading was SNAC 2 in 15 and SNAC 3 in 3 wrists according Vender staging system
Results: The AROM was higher ((120 vs 88, p ¼ 0.01) in the patients without degenerative changes on CT, they had a lower QDASH (26 vs 33) and PRWHE (19 vs 34) but these latter differences were not statistically significant. At follow up no advancement of the wrist arthritis were noted compared to the pre op X-ray
Conclusions: The results of this study showed that despite X-ray arthritic changes, the vast majority of wrists of our patients after surgery were highly functional based on range of motion (ROM), pain score, grip strength, and Quick DASH assessment tools. The clinical outcomes of this patient cohort are superior to reported results following PRC or 4CF. Our data support that scaphoid reconstruction may be an alternative option for SNAC II wrists.

A-0257 TARGETED MUSCLE REINNERVATION PROTOCOL FOR A RANDOMIZED CONTROLLED TRIAL ADDRESSING POSTAMPUTATION PAIN

Emily Pettersen[1,2], Paolo Sassu[3], Max Ortiz-Catalan[4,5]
[1]Center for Advanced Reconstruction of Extremities, Sahlgrenska University Hospital, Sweden; [2]Department of Electrical Engineering, Chalmers University of Technology, Sweden; [3]Department of Orthoplastic, IRCCS Istituto Ortopedico Rizzoli, Bologna, Italy; [4]Prometei Pain Rehabilitation Center, Vinnytsia, Ukraine; [5]Center for Complex Endorprosthetics, Osseointegration, and Bionics, Kyiv, Ukraine

Introduction: Over the past decade, human-prosthetic integration has seen major advancements, particularly through surgical techniques aimed at enhancing prosthetic limb performance. Importantly, these new interventions have also helped reduce neuropathic pain. A notable development in this area is Targeted Muscle Reinnervation (TMR), a surgical approach that redirects severed nerves to motor nerves in nearby muscles. Originally designed to strengthen myoelectric signals for improved prosthetic control, TMR has also been found effective in preventing painful neuromas and reducing postamputation neuropathic pain. Numerous studies validate TMR's role in both pain reduction and improved prosthetic function, though technical variations in the procedure have emerged as its use expands globally.
Aim: This work presents a comprehensive protocol for the TMR technique, designated as the standard procedure for an international randomized controlled trial (RCT; ClinicalTrials.gov, NCT05009394). It is also designed to support those interested in incorporating TMR surgery into their amputation care practices.

Material & Methods: A cadaveric anatomical study was conducted to carefully outline each surgical step, followed by detailed discussions with all surgeons involved in the RCT to ensure consistency in the procedure. Furthermore, expert surgeons with extensive experience in the TMR technique were consulted to offer valuable feedback on the protocol.
Results: A team of expert surgeons specializing in TMR developed and validated this detailed, step-by-step surgical protocol. TMR is a technique that redirects nerves through a structured transfer to connect with motor nerves and their corresponding motor end plates in nearby denervated muscles. The protocol is divided into four main steps: 1) Presurgical Preparations, 2) Donor Nerve Preparation, 3) Motor Point Identification, and 4) Nerve-to-Nerve Coaptation. Each step is thoroughly detailed in the written protocol, with an instructional video provided for further guidance. Successful outcomes rely on key factors such as proper mobilization of the donor nerve stump to ensure tension-free sutures, complete denervation of the target muscle, and the use of established proximal innervation points
Conclusions: This work combines expert insights to create a standardized TMR surgical protocol for the RCT, offering guidance to professionals interested in incorporating the technique into amputation care.

A-0258 PROTOCOL FOR REGENERATIVE PERIPHERAL NERVE INTERFACE SURGERY IN A RANDOMIZED CONTROLLED TRIAL ADDRESSING POSTAMPUTATION PAIN

Emily Pettersen[1,2], Paolo Sassu[3], Max Ortiz-Catalan[4,5]
[1]Center for Advanced Reconstruction of Extremities, Sahlgrenska University Hospital, Sweden; [2]Department of Electrical Engineering, Chalmers University of Technology, Sweden; [3]Department of Orthoplastic, IRCCS Istituto Ortopedico Rizzoli, Bologna, Italy; [4]Prometei Pain Rehabilitation Center, Vinnytsia, Ukraine; [5]Center for Complex Endorprosthetics, Osseointegration, and Bionics, Kyiv, Ukraine

Introduction: In the past decade, nerve reconstruction and end-organ muscle reinnervation have gained importance in prosthetic care. While initially developed to enhance prosthetic limb functionality, these procedures are now frequently used for pain management, as they have shown to alleviate postamputation neuropathic pain. A key procedure in this area is the Regenerative Peripheral Nerve Interface (RPNI), designed to promote nerve regeneration at the nerve end and prevent the formation of painful neuromas. Retrospective studies support RPNI's effectiveness in alleviating postamputation pain, though variations in the technique have emerged as its use has expanded.
Aim: This work outlines a detailed step-by-step protocol for the RPNI technique, which serves as the standardized procedure for an international randomized controlled trial (RCT; ClinicalTrials.gov, NCT05009394). The protocol also aims to support clinicians interested in incorporating RPNI surgery into amputation care practices.
Material & Methods: An anatomical cadaveric study was undertaken to outline each step of the RPNI procedure. This was followed by in-depth discussions among the RCT's surgical team to ensure consistency in the technique.
Results: The consortium of expert surgeons developed and validated this comprehensive, step-by-step protocol for RPNI surgery. The procedure involves a longitudinal dissection of the distal nerve into primary fascicles, which are then implanted into denervated, devascularized muscle grafts. The protocol is organized into four key phases: 1) Presurgical Preparations, 2) Recipient Site Preparation, 3) Donor Site Preparation, and 4) RPNI Construct Fabrication. Each phase is explained in detail within the written protocol and is supplemented by an instructional video. Critical steps include muscle harvesting aligned with muscle fibers to maintain fiber integrity and optimizing the nerve-to-muscle graft ratio to avoid central necrosis and prevent the formation of new neuromas within the RPNI construct.
Conclusions: This work fuses expert insights to establish a standardized RPNI surgical protocol for use in the RCT and to assist healthcare professionals who wish to implement this technique in amputation care.

A-0259 CLINICAL OUTCOME IN PATIENTS WITH ELBOW OSTEOARTHRITIS UNDERGONE ELBOW ARTHROSCOPY

Astrid Rosenberg, Endre Søreide, Hallgeir Bratberg, Sondre Stafsnes Hassellund
Oslo University Hospital, Oslo, Norway

Introduction: Elbow osteoarthritis (OA) occurs in 2-3 % of the population, mainly men. Typically, it leads to pain in end flexion/extension, decreased range of motion (ROM) and mechanical symptoms (locking and catching). This is due to osteophytes and loose bodies. Elbow arthroscopy may be indicated in patients with symptomatic elbow OA, aiming to improve functional outcome by removal of osteophytes, loose bodies and synovitis.
Aim: This retrospective study aimed to assess the clinical outcome following elbow arthroscopy in patients with elbow OA.
Material & Methods: Patients > 18 years old with elbow OA undergone elbow arthroscopy at Department of Orthopedic Surgery, Oslo University Hospital in 2019-2023 with at least 1-year follow up were included in the study. Patients were identified using the electronic patient charts. One surgeon did all the clinical exams and phone interviews. All patients reported pain at rest and during activity using visual analog scale (VAS). We collected following data:

1. Demographic data
2. Preoperative symptoms
3. Procedure specific data
4. Clinical examination
5. Quick-Disabilities of the Arm, Shoulder and Hand (QDASH)
6. Mayo Elbow Performance Score (MEPS)
7. Pain (VAS)
8. Clinical outcome (satisfaction, return of symptoms, complications)

Results: 84 patients met the criteria and were invited to participate in the follow up. 55 patients underwent a physical examination at the outpatient clinic, while 16 patients had digital follow up. 13 patients did not want to participate. 71 patients were included in the study. 60 were men, median age of 48 years (range 20-78). Median follow-up was 36 months (range 15-66). 41 patients had surgery of their right elbow and 49 patients had unilateral symptoms. Pain, decreased ROM and mechanical problems were the main patient reported preoperative symptoms. 44 patients reported previous injury to their elbow. Debridement, removal of osteophytes and loose bodies were most common surgical procedures. Patients reported median pain 10 (range 0-80) VAS at rest and 50 (range 0-100) VAS in activity. Median MEPS was 85 (range 35-100) and median QDASH was 18 (range 0-73). 61 patients reported less pain, improved ROM and/or decreased mechanical symptoms, while 60 patients reported they would have undergone the surgery again. 23 patients reported somewhat return of their preoperative symptoms. Three patients experienced a complication, however only one being a major complication (deep infection). Ten patients have undergone additional surgery following the initial elbow arthroscopy
Conclusions: Elbow arthroscopy seems to be a good and safe treatment option for patients with symptomatic elbow OA. Patients report improved functional outcomes, as evaluated by MEPS and QDASH, and high grade of satisfaction, with a limited complication rate.

A-0260 BRACHIAL PLEXUS INJURIES IN MODERN WARFARE. SURGICAL TIPS

Andrii Lysak[1,2], Vasyl Gaiovych[1,2], Serhii Tymoshenko[2], Anna Kyrpychova[1]
[1]SI "Main Medical Clinical Center of MIA of Ukraine", Kyiv, Ukraine; [2]SI "Institute of Traumatology and Orthopedics of the NAMS of Ukraine, " Kyiv, Ukraine

Introduction: War injuries of the brachial plexus are usually difficult and devastating trauma. According to the literature, it`s rather uncommon but severe and can cause chronic pain, loss of function, and permanent nerve damage. Due to the full-scale invasion in Ukraine, we faced a lot of casualties of upper extremity trauma, including brachial plexus injuries
Aim: To analyze our experience in treating brachial plexus warfare injuries, compare the structure of warfare and civilian injuries (in the Ukrainian population), and highlight the most important tips (in our opinion) in managing these patients
Material & Methods: 29 patients (28 males, mean age – 41,1±8,8 years) with warfare injuries of the brachial plexus compared to 237 patients (195 males, mean age – 35,6±14,8 years) with civilian one. In the group with warfare injuries: subclavian injuries prevail (68,97%) and they usually combine with clavicle fracture (60%) and subclavian artery injury (80%), roots avulsion was rare (only 1 person); the most common surgery was nerve grafting (58,62%), and neurolysis (34,48%). In the group with civilian brachial plexus trauma: supraclavicular injuries and root avulsion prevail (64,56%); the most common type of surgery was nerve transfers (48,1%)
Results: Warfare brachial plexus injuries are more common in the male population (because most of the Ukrainian armed forces are males) and for older people. Most gunshot or shrapnel injuries are subclavian, and root avulsion is uncommon. The most common type of surgery was brachial plexus nerve grafting at the level of cords and brunches, in scar-degenerated tissues after previous venous grafting or shunting of subclavian artery, and combined with clavicle plate fixation with bone graft from iliac crest. This makes brachial plexus reconstruction after warfare injuries more challenging and requires surgeon knowledge and skills in vascular repair and a basic understanding of osteosynthesis. Civilian brachial plexus trauma is more common for the younger population, and the most common etiological factor is road traffic accidents. In most cases, civilian brachial plexus injuries are root avulsion injuries that require nerve transfers or secondary reconstructions
Conclusions: Warfare brachial plexus injuries are a more challenging type of trauma that requires a deep understanding of plexus anatomy and surgical skills in vascular and orthopedic surgery.

A-0262 ROBOTIC MICROSURGERY IN HANDSURGERY, THE FUTURE FOR HANDSURGEONS?

Tom van Mulken, Hendrikje Bettens, Shan Shan Qiu, Karan Srinadam
Maastricht University Hospital, Maastricht, The Netherlands

Introduction: Precision and accuracy are essential in microsurgery. Robotic assistance can enhance precision beyond the limitations of the human hand. Microsurgeons of the Maastricht University Hospital and technical engineers of the Technical University of Eindhoven, The Netherlands collaborated and created the first dedicated robot for microsurgery named the MUSA robot.
Aim: We present the MUSA robot, the concept, preclinical studies and two prospective clinical studies in handsurgery.
Material & Methods: Two prospective clinical pilot studies are being conducted at MUMC+, to investigate the feasibility of the MUSA robot in digital nerve repair and digital replantation. Outcomes assessed include duration of the robot-assisted microanastomoses and quality of the anastomoses using the Structured Assessment of Microsurgical Skills (SAMS) score. In addition clinical patient outcomes are evaluated.

Results: Patent digital nerve anastomoses and vital digital replantation is feasible with robotic assistance.
The average duration for nerve anastomosis was 14.30 minutes (+/- 03.59min). At the 12-month follow-up, no complications were observed.
Conclusions: robot-assisted micro-anastomoses in handsurgery are feasible and safe using a dedicated robot for microsurgery (the MUSA robot). Future perspectives on robotic microsurgery in handsurgery will be discused.

A-0265 DOES RESTRICTION OF THE DOMINANT HAND DUE TO INJURY IMPROVE NON-DOMINANT HAND FUNCTION?: PRELIMINARY RESULTS: SEDANUR GÜNGÖR, ZEYNEP EMIR, CEREN ZORLUOĞULLARI, DERAN OSKAY

Gazi University, Ankara, Turkey

Introduction: Hand injuries necessitate immobilization of the injured hand in a splint or cast for about six weeks, a critical period for tissue healing. When the injury affects the dominant hand, daily activities become more challenging. Patients injured on their dominant hand mostly express that they are forced to use their non-dominant hand in their activities and as a result, the function of the non-dominant hand improves. However, changes in non-dominant hand function due to this adaptation have not been formally studied.
Aim: This study aimed to assess whether the non-dominant hand function changes in patients using splints or casts on their dominant hand during the tissue healing period.
Material & Methods: This observational cohort study included seven patients (2 females, 5 males) with dominant hand injuries, with a mean age of 30.14 ± 17.20 years. The Edinburgh Hand Preference Inventory identified their dominant hand. Eligibility criteria included a dominant hand injury requiring splint or cast immobilization. Non-dominant hand function was assessed at baseline and at six weeks, when splinting or casting was discontinued. Patients received standard care for their injured hand. The Jebsen Taylor Hand Function Test (JTHFT) assessed hand function, while the Disabilities of the Arm, Shoulder and Hand (DASH) Questionnaire measured disability level. Grip and pinch strengths (bipod, tripod, and lateral) were also recorded. Only non-dominant hand performance at baseline and six weeks was compared.
Results: All seven patients sustained injuries to their dominant (right) hand. The injuries included: one extensor pollicis longus (EPL) tendon repair, one flexor digitorum profundus (FDP) and superficialis (FDS) tendon repair, one extensor digitorum communis (EDC) tendon repair, one EPL and extensor pollicis brevis (EPB) tendon repair, two flexor carpi ulnaris (FCU) and ulnar nerve repairs, and one FCU, ulnar nerve, and FDP tendon repair. Postoperatively, four patients used a static splint with dorsal block, one used a plaster splint, one used a static splint with volar block, and one used a dynamic splint with volar block.
The results indicated significant improvements in the JTHFT subtests for card turning ($p=0.028$), handling small common objects ($p=0.043$), and simulated feeding ($p=0.043$). Tripod pinch strength also improved significantly ($p=0.028$), suggesting that restricted dominant hand use facilitated adaptive changes in non-dominant hand function.
Conclusions: Preliminary findings indicate that immobilization of the dominant hand due to injury may prompt functional enhancements in the non-dominant hand, particularly in tasks involving fine motor skills and tripod pinch strength. Improvements in activities such as card turning, object handling, and simulated feeding underscore adaptive adjustments even within a short-term constraint. Further research with a larger sample size is needed to confirm these findings, which could inform rehabilitation practices aimed at optimizing bilateral hand function following dominant hand injuries.

A-0266 CHARACTERISTICS OF PATIENTS WITH THUMB OSTEOARTHRITIS: A CROSS-COUNTRY COMPARISON STUDY BETWEEN TÜRKIYE AND SPAIN

Sedanur Güngör[1], Zeynep Emir[1], Belen Sancho Iglesias[2], Kadir Çevik[3], Leire Arana Ripalta[4]
[1]Gazi University, Ankara, Türkiye; [2]Hand Clinic Bilbao, Spain; [3]Başakşehir Çam ve Sakura Şehir Hastanesi, İstanbul, Türkiye; [4]Basurto University Hospital, Bilbao, Spain

Introduction: Thumb osteoarthritis (OA) is a prevalent condition worldwide, leading to pain, stiffness, and strength loss in the hand, which in turn results in significant functional limitations. Patients often experience a decline in hand dexterity, which can disrupt daily activities and diminish their quality of life. The impact of thumb OA may vary based on individual patient characteristics such as age, gender, employment status, and engagement in sports or other hand-intensive activities. Observational data suggest that the clinical presentation and lifestyle factors in patients from Türkiye and Spain might differ due to cultural, occupational, and recreational practices.
Aim: This study aims to compare the demographic and clinical characteristics of patients with thumb OA residing in Türkiye and Spain to identify any noteworthy differences that could inform culturally tailored approaches to treatment and management.
Material & Methods: This cross-sectional study was conducted in two clinics, located in Bilbao, Spain, and Ankara, Türkiye. Ethical approval was obtained (No: 2023-1238). Data were collected on demographics (age, gender, height, body weight) and clinical factors (dominant hand, symptomatic hand, employment status, and duration of symptoms). Patients' pain levels during rest, activity, and nighttime were measured using the Visual Analog Scale (VAS). Hand strength was assessed using the Jamar® Hydraulic Hand Dynamometer for gross grip strength and a pinch meter for bipod and lateral pinch strength. Comparative analyses were performed to assess differences between the two groups
Results: The study included 24 patients, 12 from Spain and 12 from Türkiye. The median age was 60 (52-74) years in Spain and 63 (50-70.5) years in Türkiye. In Spain, 91% of patients were female, 66.7% reported symptoms in their dominant hand, 75% were employed, and 66.7% engaged in sports. In Türkiye, 66% were female, 41.7% had dominant hand symptoms, 50% were employed, and 33.3% engaged in sports. Statistically significant differences were observed in only two areas: body weight and resting pain. Body weight was significantly higher in the Turkish group ($p=0.013$), while resting pain levels were higher in the Spanish group ($p=0.048$). Although not statistically significant, employment and sports participation rates were higher in the Spanish group, possibly reflecting cultural differences.
Conclusions: Preliminary findings suggest that patients with thumb OA from Türkiye and Spain share many demographic and clinical characteristics, with notable differences in body weight and resting pain levels. Higher body weight observed in the Turkish cohort might be associated with reduced physical activity and lower employment rates, potentially impacting symptomatology and functional outcomes. In contrast, Spanish patients reported higher resting pain, which may correlate with lifestyle or cultural factors. These findings highlight the potential influence of cultural and lifestyle factors on thumb OA and underscore the importance of considering these variables in patient care and treatment approaches.

A-0267 ARTHROPLASTY IN POST-TRAUMATIC OSTEOARTHRITIS OF THE WRIST

Maurizio Calcagni[1,2], Myrna Gunning[1,2], Inga Besmens[1]
[1]Hand Institut Zürich, Zurich, Switzerland; [2]Department of Plastic Surgery and Hand Surgery, University Hospital Zurich, Switzerland

Introduction: Degenerative and post-traumatic osteoarthritis of the wrist is a common problem. Some salvage procedures have been proposed with the ultimate goal to retain as much function as possible. Not all cases are amenable to these operations and the usual alternative is a wrist fusion.

Motion preserving surgery has a long history in degenerative diseases, but the use of wrist joint implants remains limited in post-traumatic cases. Main concerns being the survival of the implants in the long term and the indication in post-traumatic cases.
In 2019 we started to use the Motec implant in selected wrist osteoarthritis cases. We report here the results with a minimal follow-up of 12 months (range 12-56)
Aim: Analysis of PROMs and CROMs and complications after Motec® arthroplasty in post-traumatic wrist osteoarthritisMaterial & Methods: From March 2019 to November 2023, we performed 20 Motec® arthroplasties for post-traumatic osteoarthritis of the wrist. In all cases the arthroplasty was performed after one to four previous operations. Pre- and post-operative data were collected in the Swiss Upper Extremity Outcomes Registry: pain at rest and under load, PRWE, grip strength and active range of motion
Results: One patient remained a complete outlier with no change in any of the measured parameters, probably due to a non-recognised chronic pain syndrome. His data were excluded from the evaluation. All the remaining 19 patients reported a significant reduction of rest pain from 2 to 0, load pain from 8 to 1, PRWE from 58.8 (SD 17.5) to 17.7 SD (2.5). Grip strength improved in a non-significant way (12.4kg to 19.7, SD 7) and motion remained almost the same (10° improvement). One loosening of the distal component was successfully revised with a longer implant. All patients were very satisfied and would choose again the same operation
Conclusions: The results of this case series are promising with a significant reduction of pain and PRWE values, without complications. We understand well that joint replacement results should be evaluated after a longer follow-up, but after the report of Reigstad et al. the complications that lead to implant removal happens in the early post-operative time. We observed one loosening 14 months after implant, that was revised successfully.
On the other hand, one case did not improve at all because of chronic pain. He had already pain since many years and a palliative pain treatment would have been a better choice. As in other implants motion didn't improved and this should be discussed with the patient prior to surgery.

A-0269 XRAYS AND CT SCAN ANALYSIS OF PREDISPOSING FACTORS IN THUMB CMC JOINT ARTHRITIS

Jane Messina[1], Nicole Zurawsky[1], Sofia Perfetti[1], Andrea Zagarella[2], Davide Muscarnera[2], Alessandra Menon[1], Mauro Gallazzi[2], Pietro Randelli[1]
[1]First Orthopaedic Clinic University of Milan and Radiodiagnostic Unit; [2]Gaetano Pini CTO Orthopaedic Institute, Milan, Italy

Introduction: Several factors have been identified as predisposing factors to CMC joint osteoarthritis, as hyperlaxity with subluxation of thumb CMC joint, anatomical factors related to trapezium shape and obliquity, articular joint shape and congruency. XRays and recently CT scan have been used to analyze the morphology and different anatomical aspects of thumb CMC joint
Aim: is to define new radiological parameters to evaluate joint congruency that can be predisposing factor to CMC joint OA a relate these parameters to OA development.
Materials and Methods: Forty-three hands (females 35, males 8) in 23 patients affected by CMC joint OA were studied with Xrays (AP, oblique, stress view, Robert's view) and CT scan. Mean age 62 (46-84). Ethic Committee approval has been obtained. These were compared to a control group 52 normal hands (38 females and 14 males) in 26 patients, mean age 29 (25-40). The following parameters were measured: Ratio between height of overall trapezium (TH max) and height of saddle (TH min) was measured (TH max/TH min and TH max-TH min/TH max); The saddle concavity (TH max-TH min) and also already know parameters as the Ratio between first metacarpal subluxation/width of trapezium (RS/AW); Trapezium

obliquity measured on XRays as an angle with II metacarpal (alphaTT angle). Metacarpal subluxation was also measured from centre of scaphoid-centre of metacarpal base distance on CT scan (SMD). These parameters were examined by two radiologists and 2 orthopedic surgeons. Inter and intra-observer variability were measured by ICC index
Results: TH max-Th min in patients with OA was 2.63±1.7, while in normal patients was 1.52±0.5 this was statistically significant (p< 0.01)rnTH max/TH min: 1.29±0.2 while in control group was 1.13±0.05 (p<0.05)rnTH max-TH min/TH max: 0.20±0.1, while in control group was 0.11±0.04 (p< 0.01)rnRS/AW 0.28±0.11 while in control group was 0.29±0.19 non significantrnalphaTT 38.17°±11.6, in control group 33.10±6.23 (p<0.01)rnCT scan: SMD 18.17± 3.21 in patients (CT scan were not done in normal patients for ethical reasons)rnAll parameters were related to OA severity in a statistically significant way (p<0.01) except for RS/AW and SMDrnIntra-observer ICC values were good for TH max/TH min and TH max-TH min/TH max, excellent for THmax- TH min, RS/AW, alphaTT angle and SMD. Inter-observer ICC values were excellent for all parameters
Conclusions: The results show that proposed parameters measuring saddle concavity are signficantly increased in the pathological group compared to normal and increase with the development of OA. The metacarpal subluxation is better evaluated with CT scan as it develops in three planes; it was not significantly different in patients and controls this means that laxity is present in all cases. The studied parameters have demonstrated good and excellent intra-observers variability and excellent inter-observer variability in all parameters. Defining predisposing factors to thumb CMC joint OA can be useful in order to prevent the disease and to treat the patients early. In the clinical practice they can be useful particularly in planning trapezium reshaping in partial trapeziectomy or to improve implants designrn

A-0270 THUMB CARPOMETACARPAL JOINT REPLACEMENT – A SINGLE-CENTRE 6-YEAR EXPERIENCE OF COMPLICATIONS, REVISION SURGERY AND IMPLANT SURVIVORSHIP

Markus L Sagmeister, Simon F Bellringer, Riem Johnson Laura Hamilton, Lisa Leonard, Chris Williams
University Hospitals Sussex, Brighton, UK

Introduction: Thumb carpometacarpal joint (CMCJ) prosthetic total replacement has excellent functional and pain-relieving outcomes in the management of thumb base arthritis when no complication occurs.
Aim: The aim of this study was to identify this procedure's complication profile, surgical revision rate and implant survivorship.
Material & Methods: 134 primary CMCJ replacements performed using the MAÏA Standard prosthesis in 110 patients with a minimum follow up of 12 months (mean 40 months, range 12-72 months) were identified at a single centre. Complications were identified and classified according to the Dindo-Clavien Classification. Implant survivorship was recorded.
Results: The overall complication rate was 17.2% (23/134). Eleven patients (8.2%) had Type II complications managed non-operatively, while 12 patients (9%) had Type III complications requiring re-operation. No patient had type III or IV complications.
Type II complications included CRPS (n=6; 4.5%), De Quervain's tenosynovitis (n=3; 2.2%), trigger thumb (n=1; 0.7%) and superficial wound infection (n=1; 0.7%) and were successfully managed with hand therapy, oral medications or injections. The commonest type III complication was dislocation (n=7; 5.2%), while stiffness (n=3; 2.2%), De Quervain's tenosynovitis (n=1; 0.7%) and carpal tunnel syndrome (n=1; 0.7%) were less frequent causes for re-operation. Of the 12/134 patients undergoing re-operation, six (4.5%) underwent implant exchange and one (0.7%) underwent implant removal with trapeziectomy. Five (3.7%) underwent soft tissue procedures. Implant survivorship was 97% at 12 months post-op and 94.7% when examining all follow-up data (12-72 months). Conclusions: CMCJ replacement has an overall complication

rate of 17.2%. The commonest type II complication was CRPS. The commonest indication for re-operation was dislocation. Re-operation was necessary in 9%, with 5% requiring implant revision or removal. A high early implant survivorship of 97% at 12 months was observed in our series .

A-0271 SINGLE TUNNEL TRANSOSSEOUS ARTHROSCOPIC REFIXATION OF TFCC

Jane C Messina, Simone Gallizzi, Valeria Vismara, Pietro Randelli
First Orthopedic Clinic, University of Milan, Gaetano Pini- CTO Orthopedic Institute, Milan, Italy

Introduction: Instability of distal radio-ulnar joint (DRUJ) is caused by a foveal detachment of TFCC which is the primary stabilizer of this joint. From the literature arthroscopic techniques of refixation of TFCC repair have been widely used. In order to perform foveal refixation principal used methods are different types of anchor sutures, or double tunnel technique. These techniques may have complications related to implant mobilization or incompetence, difficulty in creating a double tunnel as bone in distal ulna may be softened. For this reason a single tunnel technique footprint foveal repair has been proposed by Chen with four resorbable threads that has the advantage of one single tunnel, increase of refixation area, re-tensioning or repair of radio-ulnar ligaments

Aim: the aim of this study is to present the results of this one tunnel technique with the use of two threads instead of four in order to simplify the technique and reduce operating times, and compare them to the original technique

Material & Methods: We have treated 13 patients with this modified Chen's technique, mean age 41yo(16-64), 8 Males, 5females, 8 cases dominant wrist. Patients were affected by foveal detachment of TFCC (Atzei class II or III) diagnosed under arthroscopy. Nine patients were evaluated with a mean follow up 9.5months (6- 14 months). Four patients operated recently are still under study. All patients had pre-operative pain and limitation of work and sports activities especially under load. Pre-operatively all patients had ballottement test positive (mean 2,1/3), mean VAS was 7.25 +/-0.9, mean Mayo 49.44 +/-12, mean DASH 39.72 +/-20.1, mean PRWE 62.7 +/-23, mean Grip 15 Kg+ /-3.4Results: All scores improved in post-operative evaluation. Mean Mayo score obtained was 92.5 +/-6.45 (excellent) $p< 0.01$, mean DASH 4.16 +/- 1.6 $p< 0.01$, PRWE 9.9 +/- 8.2 $p< 0.01$, mean VAS 0.75 +/- 0.9 $p< 0.01$. All functional scores improved and were statistically significant. Ballottement test was negative in all patients (0/3) compared to pre-op ($p<0.01$). Mean Grip raised to 28Kg ($p<0.08$). Comparing the results of the original technique to the modified technique the results were similar. In fact Chen's results were: Mayo 95 (90-100) compared to modified technique 92+/-6.45; Chen's DASH 10(9-15) compared to modified technique 4.16+/-1.6

Conclusions: The advantage of this simplified technique are: the creation of a single ulnar tunnel, the use of a two resorbable thread for the refixation of TFCC, no residual material in the joint, re-tensioning or repair of radio-ulnar ligaments in addition to refixation, reduction of operating time. From our preliminary results TFCC foveal refixation can be performed by modified Chen's technique with excellent results, similar to the original technique. A wider study with a longer follow up is needed to give definitive results

A-0272 A NOVEL 3D PRINTED PHALANGEAL COMPLEX FOR USE IN SURGICAL SIMULATION: OUR DESIGN AND APPLICATION IN THE UNDERGRADUATE SETTING

Leo Gundle[1], Holly Sheldon-Wilson[2], Robert Gregson[3], Alfred Owens[3], Melanie Moffat[3], Shakeel Rahman[1]
[1]St Thomas' Hospital, Westminster Bridge Road, London, United Kingdom; [2]University of Southampton, Southampton, United Kingdom; [3]University of Bristol, Tyndall Avenue, Bristol, United Kingdom

Introduction: Early introduction to surgical skills and practical learning can improve skill acquisition, interest in a surgical career and confidence in formative training years. Despite surgical placements forming part of standardised modules at UK medical schools, there is considerable heterogeneity in access to both teaching and practice of surgical skills.
Surgical simulation has been shown to improve confidence and competence in surgical skills, and can help bridge the gap between learning and performing surgical skills. Many surgical simulators are low fidelity, which we have found in our practice to be a limitation to surgical skills acquisition.
Aim: Our aims were to (1) test and utilise our novel 3D printed phalangeal complexes in a course context to validate them as a training tool, and (2) improve undergraduate confidence and understanding of K-wire fracture fixation, and use and understanding of Suzuki frames.
Material & Methods: We designed a cortico-medullary differentiated model phalangeal complex. Open-source models of the 3rd proximal, middle and dorsal phalanges were modified fully procedurally within Blender. Cortex thickness was ultimately set at a constant 1.25mm during batch-production. Simulators manufactured in PLA using a Bambu X1C FDM 3d-printer (slicing performed in OrcaSlicer). Medulla consists of gyroid pattern infill at density of 10%.
In a course environment, we delivered a lecture on the fundamentals of k wiring and Suzuki framing to 16 undergraduate medical students. Students were then grouped into sets of 3 or 4, and received a 40 min workshop on k wiring and suzuki frame application, using our novel simulator.
Results on student satisfaction, confidence and overall enjoyment were collected via electrictronic feedback forms using a combination of 5 point Likert scales and white space questions for qualitative impressions
Results: Overall students reported highly favourable impressions of the course, with all students rating the workshop a 4 or 5 out of 5 for overall quality. 90% of students reported either a 4 or 5 out of 5 for ease of use of simulator.
Students reported a great improvement in confidence, knowledge of K-wiring indications and techniques, and overall competence in performing basic K-wire fracture fixation. Our workshop was described as effective, with good teaching and enjoyable delivery
Conclusions: Overall the K-wiring course was highly effective at better preparing students to understand principles and undertake basic K-wire fixation. A particular highlight for students was the use of our simulators. For many it was their first experience of surgical drilling, and the unique haptic feedback of both the metacarpal and phalange simulators offered them real-time estimation of whether they were passing through cortex or medulla. This as opposed to theory alone or non-differentiated simulators will help students transition from classroom to operating theatre. We look forward to continuing to deliver workshops with high-quality simulators, and advocate educators do the same.

A-0275 GLYCAEMIC CONTROL AND PATIENT REPORTED OUTCOME AFTER OPEN TRIGGER FINGER RELEASE IN TYPE 1 AND TYPE 2 DIABETES MELLITUS

Mattias Rydberg[1], Marianne Arner[2]
[1]Department of Hand Surgery, Lund University, Skåne University Hospital, Malmö, Sweden; [2]Department of Clinical Science and Education, Karolinska Institutet, Stockholm, Sweden

Introduction: Trigger finger usually has a successful outcome after surgery, also among individuals with diabetes mellitus. However, whether strict glycaemic control among individuals with diabetes affects long term outcome after open trigger finger release (OTFR) is still unknown.
Aim: To analyse the effect of high Hb1Ac on patient reported outcome after OTFR in patients with type 1 (T1DM) and type 2 diabetes mellitus (T2DM).
Material & Methods: The study used data from all OTFR registered in the Swedish national quality register for hand surgery (HAKIR) in individuals ≥18 years 2010–2020 that were crosslinked with the Swedish national diabetes register (NDR). The patient reported outcome measurements included the HQ8, an 8-point questionnaire specially designed for HAKIR, and QuickDASH. The HQ8 includes questions regarding stiffness, pain on load and pain on motion without load, preoperatively and at three and twelve months, as well as patient satisfaction after three and twelve months. Individuals were divided into tertiles according to their mean HbA1c using cut-of lines for "optimal control" ≤ 48 mmol/mol, "acceptable control" 48.1 – 64 mmol/mol, and "poor control" > 64 mmol/mol. As there were only five individuals with T1DM in the "optimal" group, these were excluded. A linear mixed model regression analysis was performed, stratified for T1DM and T2DM, adjusted for sex, age, duration of DM, smoking, mean arterial pressure, body mass index and physical activity. The model presented adjusted means with standard errors and analysed how HbA1c levels affected patient reported outcome over time, using the "acceptable control" group as reference group. To adjust for multiple comparisons, a Bonferroni correction was used.
Results: In total, 496 individuals with T1DM and 869 individuals with T2DM underwent OTFR and were registered in HAKIR. Of these, 53% (n = 710) answered at least one questionnaire. All HbA1c groups improved their overall QuickDASH scores as well as all studied HQ8-questions three months after surgery ($p < 0.001$) and further improvement could be seen from three to twelve months ($p < 0.001$). There was no difference in QuickDASH nor HQ8 at twelve months between the different HbA1c groups, neither in individuals with T1DM nor T2DM
Conclusions: In this study, poor glycaemic control was not associated with worse patient reported outcome twelve months after OTFR. Thus, for long term outcome, preoperative HbA1c testing does not seem to be necessary among individuals with diabetes mellitus.

A-0276 IS THERE AN ASSOCIATION BETWEEN INDUSTRY PAYMENTS AND THE REPORTED RESULTS AFTER NERVE REPAIR USING CONDUITS OR GRAFTS?

Nienke A. Krijnen[1,2], Ishan S. Patel[3], Onyedi Moses[4], Kacey Marra[1], Robert J. Goitz[1] Teun Teunis[1]
[1]University of Pittsburgh Medical Center, Pittsburgh, PA, USA; [2]University Medical Center Utrecht, Utrecht, Netherlands; [3]Albany Medical College, Albany, NY, USA; [4]Barts Health NHS Trust, London, United Kingdom

Purpose: Nerve conduits and grafts are increasingly used in nerve surgery. Their development was facilitated by the strong collaboration between physicians and industry, but as a result much of current literature on their use is funded by industry. The potential association between industry payments and the reported results is unknown. We asked: (1)

What is the association between industry payments to study authors and meaningful recovery (MR) after nerve repair with a nerve conduit or graft? (2) What is the association between industry payments and static two-point discrimination (2PD) and Semmes-Weinstein monofilament (SWMF) testing?

Methods: We systematically searched PubMed, Embase, Medline and Cochrane for studies reporting on outcomes (Medical Research Council Classification [MRCC], 2PD, SWMF) from nerve repair using non-autologous nerve conduits or grafts, published from 2012 to April 2024. We excluded animal studies, non-English studies, review articles, and studies without physicians from the United States. We screened 2677 articles and included 41 that reported on 1703 nerve repairs (1454 allografts and 249 conduits). MR was defined as MRCC≥S3/M3. Amount of nerve- and allograft-related payments received by each author was extracted from the Open Payments database (OPD) from 2013 to 2022. There were no randomized controlled trials comparing autologous grafts with allografts or conduits, indicating substantial potential for bias in study design

Results: Although 38% of included studies did not report a conflict of interest, all but for one study included authors who received nerve-related payments (median 36,948 per author, range 0 to 410,486). Since there was only 1 study with authors without payment, we decided to forgo meta-analysis. Descriptive analysis indicates that MR after nerve conduit or graft was 80%. All articles reporting poor MR received less than 20.000 dollars nerve-related payments per author. Also, poor outcomes of 2PD and SWMF testing were exclusively reported in articles with less nerve-related payments.

Conclusion: We found a strong financial relationship between authors and industry in studies on nerve conduits and grafts. There is some indication of a potential association between lower industry payments and diminished reported recovery. Combining this with the fact that MRC, 2PD and SWMF are somewhat subjective outcomes, we need randomized, double blinded studies in order to justify the costs of grafts or conduits, or the donor site morbidity of autografts.

A-0278 MANAGEMENT OF SCAPHOID NON-UNIONS USING CUSTOM 3D-PRINTED TITANIUM PARTIAL AND TOTAL SCAPHOID PROSTHESES WITH RECONSTRUCTION OF THE SCAPHOLUNATE INTEROSSEOUS LIGAMENT

Giuseppe Rovere[1,2], Alessio Cioffi[3], Francesco Bosco[3], Lawrence Camarda[3]

[1]Department of Orthopaedics and Traumatology, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy; [2]Department of Clinical Science and Translational Medicine, Section of Orthopaedics and Traumatology, University of Rome 'Tor Vergata', Rome, Italy; [3]Department of Orthopaedic Surgery (DICHIRONS) University of Palermo, Palermo, Italy

Introduction: Treatment of scaphoid fracture sequelae is still an unsolved problem in hand surgery. Custom-made 3D-printed titanium partial and total scaphoid prosthesis and scaphoid interosseous ligament reconstruction (SLIL) are performed in cases of non-union and isolated aseptic necrosis of the proximal scaphoid pole and when it is impossible to save the scaphoid bone, respectively.

Aim: This study aims to evaluate the clinical, functional and radiographic results after these two prosthesis implantations.

Material & Methods: Between January 2019 and July 2020, nine partial and ten total scaphoid prostheses were implanted using custom-made 3D-printed titanium implants. Evaluation criteria included carpal height ratio (CHR), radioscaphoid angle, wrist extension and flexion, radial deviation and ulnar deviation of the wrist, grip strength and pinch strength, Visual Analogue Scale (VAS), the Disabilities of Arm, Shoulder, and Hand (DASH) score, and the Patient-Rated Wrist Evaluation (PRWE).

Results: Clinical, functional, and radiographic improvements were found in all outcomes analyzed for both patient groups. The VAS pain scale obtained the most remarkable improvement at the one-year follow-up. The results of the DASH scores

and the PRWE were good, with a great rate of patient satisfaction at the end of the follow-up. SLIL reconstruction also provided excellent stability and prevented a mid-carpal bone collapse in the short- and medium-term follow-up.
Conclusions: A custom-made 3D-printed titanium partial or total scaphoid prosthesis is a viable solution for patients with scaphoid non-union and necrosis or complete scaphoid destruction in whom previous conservative or surgical treatment has failed

A-0279 METABOLIC FACTORS AND THE RISK OF DEVELOPING DUPUYTREN'S DISEASE IN INDIVIDUALS WITH DIABETES MELLITUS

Märta Backman[1], Jesper Nordenskjöld[1,2], Mattias Rydberg[1,2]
[1]Department of Hand Surgery, Lund University, Skåne University Hospital, Malmö, Sweden; [2]Department of Translational Medicine – Hand Surgery, Lund University, Lund, Sweden

Introduction: Diabetes mellitus (DM) is a known risk factor for Dupuytren´s disease (DD), however, the exact mechanisms by which DM increases the risk of DD remains unclear. This study aimed to investigate the relationship between glycemic control and DD in individuals with type 1 (T1D) and type 2 diabetes (T2D), as well as to identify other metabolic factors that may serve as either protective or predisposing factors in the development of DD among individuals with DM.
Material & Methods: This retrospective register study crosslinked data from the Swedish national diabetes register (NDR) and the Skåne healthcare register (SHR). Data from 9677 T1D and 86362 T2D patients, aged ≥ 18 years old from the Region of Skåne were included between 2004-2019. Two sex-stratified, multivariable logistic regression analyses were performed to calculate associations between HbA1c and DD. HbA1c levels, calculated as the mean of all recorded values during the study period (2004-2019), were categorized into tertiles representing optimal (HbA1c <53 mmol/mol), intermediate (HbA1c 53-64 mmol/mol), and poor glycemic control (HbA1c >64 mmol/mol), with optimal glycemic control serving as the reference category. The first model adjusted for age, while the second included further adjustments for body mass index (BMI), diabetes duration, triglyceride levels, and smoking status. Results were presented as odds ratios (OR) with 95% CI. Finally, an interaction analysis assessed the combined effect of HbA1c levels and diabetes duration on DD risk
Results: A total of 91 women and 162 men with T1D and 214 women and 747 men with T2D were diagnosed with DD during the study period. In women and men with T2D, no associations were found between higher HbA1c levels and the risk of DD in the fully adjusted model. In T1D, men with poor glycemic control demonstrated a higher risk of DD in both models (model 2 OR: 1.9, 95% CI: 1.1 - 3.2, $p = 0.01$), while this was not observed in women. A low, although significant inverse relationship between BMI and DD was observed in both men and women with T2D (women OR: 0.97 95% CI: 0.94-1.00, $p < 0.05$, men OR: 0.95, 95% CI: 0.93-0.96, $p < 0.001$) but not in T1D. The interaction analyses indicated that longer diabetes duration increased the risk of developing DD in both T1D and T2D, regardless of Hb1Ac levels ($p < 0.001$)
Conclusions: This study indicates complex associations between DD, blood sugar control, diabetes duration and BMI in individuals with T1D and T2D, with risk patterns varying between diabetes types and sex. These findings emphasize the importance of diabetes management in potentially reducing the risk of DD, even though the effect of HbA1c was mediated by diabetes duration. Further research is necessary to fully understand the risk and protective factors, as well as the underlying mechanism contributing to the development of DD in individuals with DM.

A-0280 PHOTON-COUNTING DETECTOR CT PROVIDES HIGH PRECISION QUANTIFICATION OF TOTAL WRIST IMPLANT MIGRATION AT A LOW RADIATION DOSE

Gustav Lind[1], Erik Tesselaar[1], Olof Sandberg[2], Simon Farnebo[1]
[1]Linköping University, Sweden; [2]Sectra, Sweden

Introduction: Total wrist arthroplasty (TWA) has been proven effective to treat painful wrist arthritis. Still, the primary concern after TWA remains implant loosening, with an implant survival rate of 82% for the Motec arthroplasty system, at ten years. Traditionally, radiostereometric analysis (RSA) has been the gold standard for measurement of implant migration, however newer technology without implanted beads that use computer tomography micromotion analysis (CTMA) has emerged as an alternative due to its higher precision.

Aim: We have in this study assessed if there are benefits with using novel photon-counting detector CT (PCD-CT) compared to conventional energy-integrating detector CT (EID-CT) for higher CTMA precision, and if the radiation dose can be reduced with without losing precision.

Material & Methods: 8 patients with TWA implants (Motec, Swemac AB, Linköping, Sweden), were scanned with PCD-CT both post-surgery, at 6 months, and at 12 months. Additionally, one cadaveric wrist with the same implant was scanned 20 x 2 times with EID-CT and 20 x 2 times with PCD-CT at two radiation doses, with manual repositioning in between scans. PCD-CT scans were reconstructed with 0.2 mm and 1.0 mm slice thickness.

Migration and precision data were calculated using CT-RSA (CTMA, Sectra, Sweden).

Results: For the patients, as measured by median (LQ, UQ); at 6 months the base of the proximal component had moved -0.04 (-0.08, 0.05) mm distally. At 12 months it had moved 0.01 (-0.09, 0.06). The total translation at these two time points was 0.10 (0.06, 0.16) mm and 0.10 (0.07, 0.22) mm respectively. The rotation around the proximal/distal axis at these two time points was 0.03 (-0.21, 0.25) degrees and 0.06 (-0.11, 0.45) degrees. The total rotation was 0.29 (0.14, 0.35) degrees and 0.25 (0.13, 0.48) degrees.

For the distal component the base had moved 0.04 (0.02, 0.06) mm and 0.02 (-0.02, 0.04) mm at 6 and 12 months. The corresponding total translation was 0.09 (0.07, 0.21) mm and 0.15 (0.07, 0.23) mm. The rotation around the proximal/distal axis was 0.44 (0.10, 0.71) degrees and 0.17 (-0.07, 0.49) degrees at 6 and 12 months. The total rotation was 0.45 (0.31, 0.82) degrees and 0.35 (0.27, 0.53) degrees.

For the cadaveric wrist, the precision of total implant rotation was significantly better with PCD-CT at half the radiation dose (0.08 degrees) compared to full-dose EID-CT (0.15 degrees, $p = 0.002$). Similarly, precision of translation at the implant tip was reduced with half-dose PCD-CT (0.02 mm) relative to EID-CT (0.03 mm, $p = 0.04$).

For rotation measurements, the precision (95% CI) ranged from 0.04 to 0.32 degrees with EID-CT and from 0.02 to 0.10 degrees with PCD-CT. For migration measurements, the precision ranged from 0.02 to 0.03 mm with EID-CT and from 0.02 to 0.07 mm with PCD-CT.

Conclusions: This study illustrates that PCD-CT can enable migration data measurements at a very high precision at a lower radiation dose. The precision values all compare favourably to literature, and the results indicate that the Motec arthroplasty components only show very small movements during the first year after implantation.

A-0282 BEYOND WATCHFUL WAITING: RETHINKING DIGITAL NECROSIS MANAGEMENT IN THE AGE OF TOUCHSCREENS

Rishabh V Jain, Andrew R McKean, Shakeel M Rahman, Asmat H Din, Edmund Fitzgerald O'Connor
Guy's and St Thomas' NHS Foundation Trust

Introduction: In the context of major trauma and cardiac arrest, high dose inotropic and vasopressor usage can lead to distal digital necrosis. Digital necrosis management traditionally involves watchful waiting to allow demarcation between viable and necrotic tissue for maximal tissue retention. However, increasing dependence on touch screen technology has introduced challenges for patients with necrotic digits due to capacitive screens requiring conductive tissue, which necrotic tissue lacks.
Aim: This paper explores the impact of smartphone use on the management of digital necrosis, proposing alternative strategies that could better support patient functionality.
Material & Methods: Cases of digital ischemia and necrosis in relation to modern touchscreen technology were explored from the literature. Viability and functionality of necrotic or dry tissue with capacitive touchscreens was explored in the context of electric conductivity. Additionally, alternative management approaches such as earlier terminalization or the use of conductive gloves were considered to address the functional needs of patients reliant on smartphones.
Results: The literature review identified that patients with necrotic fingers face significant challenges in using smartphones due to the non-conductive nature of necrotic tissue. While the traditional expectant management strategy remains clinically sound for tissue preservation, it may prolong functional impairment. Alternative approaches, including early terminalization, conductive gloves or assistive also offer an interim solution while following a watchful waiting approach
Conclusions: With the widespread reliance on smartphones, the traditional watchful waiting management of digital necrosis may no longer fully meet patients' needs for functional independence and social connectivity. Early terminalization or the use of conductive gloves offers a way to improve quality of life by restoring the ability to interact with touchscreens sooner. A shift in the management paradigm, considering these technological and functional needs of patients, may improve patient quality of life sooner.

A-0283 COMPARATIVE STUDY OF CERCLAGE WIRING WITH IMMEDIATE POST-OPERATIVE MOTION IN SPIRAL/ OBLIQUE METACARPAL SHAFT FRACTURES UNDER WALANT SURGERY WITH AND WITHOUT IMMOBILIZATION

Wuttipong Siriwittayakorn[1], Parod Teantunyakij[1], Wattanai Atthakorn[1], Jirawat Chotayakul[1], Wichit Siritattamrong[2]
[1]Nakornping Hospital, Chiang Mai, Thailand; [2]Chularat 3 Hospital, Samut Prakarn, Thailand

Introduction: Studies about cerclage wiring fixation for simple spiral or oblique metacarpal shaft fractures are scarcely reported. Biomechanical studies always stated that every flexible fixation is not rigid as plate and screws fixation. However, all biomechanic study was done in bare cadaveric bones without considering muscle and ligament support. Currently, there is no biomechanical study for cerclage wiring. It is believed that cerclage wiring fixation technique lacks rigidity and requires post-operative immobilization. Nonetheless, there is no consensus on post-operative management following metacarpal fixation. Based on our experience treating metacarpal fractures with WALANT surgery, we have always observed that cerclage wiring is rigid enough to maintain fracture stability from intra-operative period until solid bone union is achieved without any immobilization.
Aim: We aim to verify that immediate hands-free mobilization after cerclage wiring in non-thumb metacarpal fractures is feasible and effective. We also want to share our experience treating various metacarpal fractures with flexible fixation techniques under WALANT surgery without post-operative immobilization.

Material & Methods: This is a retrospective study of patients with simple spiral or oblique non-thumb metacarpal shaft fractures. All patients were treated with cerclage wiring with immediate post-operative active hand motion. The study included 29 patients, divided into two groups: Group A, with 14 patients who had no post-operative immobilization, and Group B, with 15 patients who were fitted with a volar wrist splint after surgery for 2 weeks. The hand mobilization protocol with volar wrist splint was previously described. The primary outcomes were metacarpophalangeal (MCP) joint range of motion (ROM), quick Disability of Arm, Shoulder, and Hand (qDASH) score and Patient-rated wrist evaluation (PRWE) score. All patient was followed until 12 weeks post-surgery.
Results: Patients in Group A had significantly better MCP joint ROM at 2 and 4 weeks post-operatively. The qDASH and PRWE scores were significantly better in Group A at 2 weeks post-operatively but showed no difference after the splint was removed. All fractures united within 12 weeks after surgery. There were no cases of infection, implant breakage, or re-fracture. Multi-level mixed-effect linear regression analysis showed that splinting has a significant negative impact on MCP joint ROM (coefficient = -5.945, p = 0.021)Conclusions: A live biomechanical demonstration of cerclage wiring stability is always witnessed intra-operatively using WALANT technique. Cerclage wiring alone is rigid enough to maintain fracture stability throughout the treatment course. Gentle hand mobilization never causes fracture displacement or fixation failure. Post-operative immobilization after cerclage wiring in simple spiral or oblique metacarpal shaft fractures is unnecessary and also reduce MCP joint ROM and functional outcome. Immediate gentle hands-free mobilization can be encouraged immediately following the surgery.

A-0284 FAILURE OF A SCAPHOMETACARPAL ARTHROPLASTY USING A DUOMOBILITY PROSTHESIS

Nico Schwalfenberg, Martin Richter
Helios Klinikum Bonn/Rhein Sieg, Germany

Introduction: Failure of a scaphometacarpal arthroplasty with a duomobility prosthesis ("Touch", Keri Medical) after symptomatic proximalization of the thumb due to a previous CMC1 resection arthroplasty.
Aim: To demonstrate biomechanical complications and possible limitations of the use of scaphometacarpal prosthesis in patients with pre-existing metacarpal instability.
Material & Methods: Case report of a 53-year-old female patient who was fitted with a scaphometacarpal “Touch” duomobility prosthesis after symptomatic proximalization following previous CMC1 resection arthroplasty and developed worsening of carpal instability and thumb mobility. Radiologic diagnosis showed an implant with no signs of loosening or dislocation. The entire proximal row was in DISI position with a dorsal subluxation of the proximal capitate. The remaining ST joint showed no signs of severe osteoarthritis. Fluoroscopy revealed a snapping phenomenon of the first carpal row in the lateral projection. A classic “clunk” was not detectable.
Results: A probationary RL fusion was performed, resolving the snapping phenomenon, but arthroscopy revealed significant cartilage damage to the capitate. As the patient refused metacarpal fusion, she was treated by revision surgery with cup and neck explantation, metacarpolysis, implantation of a rib chondral graft and temporary scapho-capitate K-wire transfixation for 6 weeks
Conclusions: The use of a duomobility prosthesis could be an option for the treatment of symptomatic proximalization after CMC1 resection arthroplasty in selected cases but does not appear to be a solution in patients with carpal instability and may lead to worsening of symptoms in this situation.

A-0285 ASYMMETRICAL ARM SWING DURING GAIT IN CHILDREN WITH BRACHIAL PLEXUS BIRTH INJURY

Eliza Buttrick[1], Meagan Pehnke[1], Valentina Graci[2], Sayaka Mori[1], Elliot Greenberg[1], Shaun Mendenhall[3], Apurva S Shah[1]
[1]Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, PA, USA; [2]Center for Injury Research and Prevention, The Children's Hospital of Philadelphia, Philadelphia, PA, USA; [3]Division of Plastic Surgery, University of Utah Health, Salt Lake City, UT, USA

Introduction: Children with brachial plexus birth injury (BPBI) often report notable differences in arm movement between the affected and unaffected arm during sports activity, though this has not been investigated.
Aim: The aim of this study was to characterize abnormalities in arm swing during gait in children with BPBI and to explore asymmetry in arm movement and asynchrony with the lower extremities.
Material & Methods: Patients between 5-17.99 years old with BPBI at a single children's hospital were prospectively evaluated. We used an Inertial Measurements Unit system (XSENS, Movella Inc.) to collect bilateral shoulder and elbow three-dimensional kinematics and toe velocity during a 60-feet sprinting task. A custom-made MATLAB program was used to extract toe strike which defined each gait cycle start and end as well as peak shoulder and elbow flexion (positive) and extension (negative) angles during the gait cycles, and the time difference between toe strike and maximum shoulder and elbow flexion/extension of the opposing sides. Patient-reported outcomes including the Children's Hand-Use Experience Questionnaire (CHEQ) and PROMIS Anxiety and Peer Relations modules were administered. Paired T-tests compared sides, and one sample Mann-Whitney tests evaluated CHEQ scores.
Results: Twenty-two patients were tested at an average age of 8.5 ± 3.2 years. Patients achieved less maximum shoulder extension (-1.83º versus -37.19º, $p<0.01$) and less maximum elbow flexion (58.4º versus 79.1º, $p<0.01$) on the affected side compared to the unaffected side. Although peak shoulder extension was reached at similar time point on both affected and unaffected side during the gait cycle (mean 0.18 versus 0.12 seconds, $p=0.3$), there was more variation in timing of peak shoulder extension on the affected side (SD 0.12 versus 0.07, $p=0.02$), suggesting less consistency cycle-to-cycle, with similar findings regarding maximum elbow extension [mean 0.14(affected) versus 0.09(unaffected), $p=0.50$; SD 0.19(affected) versus 0.12(unaffected), $p=0.04$]. On the mini CHEQ (ages 5-7.99, normal=4) and the CHEQ (age 8+, normal=100), patients reported significantly lower hand capacity during activities (mean 3.0, 58.9), longer average time to complete tasks (2.9, 63.6), and were more bothered by their arm function (mean 3.2, 69.5) than normal ($p<0.01$ for all). Patients scored within normal limits on the PROMIS Peer Relations and Anxiety modules (mean 53.4 ± 7.3 and 50.5 ± 8.9, respectively).
Conclusions: BPBI causes arrhythmic arm swing in pediatric patients and worsens coordination with leg movements while sprinting. Specifically, children with BPBI demonstrate less maximum shoulder extension and elbow flexion as well as decreased coordination with leg movements, ultimately reducing efficiency with sprinting. Overall, children felt bothered by their arm function.

A-0286 NEW PROPOSED FLEXOR TENDON SUTURE - STRENGTH COMPARATIVE STUDY ON PORCINE TENDON MODEL. CHEAPER, EASIER AND STRONGER

Szymon Manasterski, Michał Chęciński, Maja Smorąg, Piotr Węgrzyn, Jędrzej Króliński, Paweł Stajniak, Marta Jagosz, Ahmed Elsaftawy
St. Jadwiga Śląska Hospital in Trzebnica, Poland, Department of Plastic and Hand Surgery

Introduction: Effective flexor tendon repair in the second zone is a challenging area due to limitations in suture options that may cause contractures and stiffness due to the lack of opportunities for active rehabilitation after primare tendon

repair with well known sutures as modified Kessler, Jin Bo Tang or FiberLoop.
Aim: To evaluate the durability and efficacy of the Elsaftawy suture compared to Jin Bo Tang 6 string looped suture, 4 string 3/0 nonabsorbable modified Kessler and Artrex Fiberloop 4/0 focusing on the 2mm gap formation, tensile strength and time of application.
Materials and Methods: Forty porcine flexor tendons were divided into four groups, lacerated and then sutured using four techniques: the Jin Bo Tang 6-string suture, FiberLoop 4/0 suture by official Artrex 16 step method, modified Kessler 4-string 3/0 suture and novel Elsaftawy 3/0 6-string suture. Measurements included 2mm gap formation force, failure point force using a Sauter FK250/0.1N force meter and suturing time. All sutures were performed by a single surgeon using the same equipment. All used tendons came from the same source. All results were of normal distribution. Results were statistically analyzed with ANOVA test to assess statistical significance between analyzed groups.
Results: Two millimeter gap formation result average were respectively: Jin Bo Tang 56,4N [SD 10N], Elsaftawy 51,8N [SD 6,5], Kessler 29,01N [SD 6,26], FiberLoop 41,6N [SD 5]. Failure point force result average were as follows: Jin Bo Tang 86,4N [sd 16,5N], Elsaftawy 83,1N [sd 13], Kessler 60N [sd 11], FiberLoop 53N [sd 7]. Time to suture result average were as follows: Jin Bo Tang 271 seconds [sd 26,5s], Elsaftawy 264s [sd 35], Kessler 250s [sd 45s], FiberLoop 200 [sd 23]. There were no statistical difference between Jin Bo Tang and Elsaftawy suture regarding 2mm gap formation ($p=0.2368$) and failure point force ($p=0,6232$). Both Jin Bo Tang and Elsaftawy suture were on avare stronger than FiberLoop (using official 16 step method) and 4 string Kessler ($p<0.05$). FiberLoop is significantly faster that other tested sutures ($p<0.05$)
Conclusions: The Elsaftawy suture showed no significant difference in 2mm gap formation force compared to the Jin Bo Tang and matched it in tensile strength, outperforming the Kessler and FiberLoop sutures in durability. While FiberLoop had the shortest application time, no time difference was found between the Elsaftawy, Jin Bo Tang, and Kessler sutures. The Elsaftawy suture provides comparable strength to the Jin Bo Tang technique with a simpler and more accessible technique. It minimizes 2mm gap formation and enhances pretension, potentially reducing adhesion risks. This suture offers an affordable, effective alternative for tendon repair, particularly beneficial for surgeons less experienced in hand surgery.

A-0287 THE FREE VASCULARISED ILIAC CREST GRAFT FOR BONY DEFECT REPAIR

Johannes Rois[1], Heinz Bürger[2]
[1]AUVA Traumacenter Vienna Meidling, Vienna, Austria; [2]Klagenfurt, Austria

Introduction: High energy trauma, extensive comminuted fractures or the consequences of an infection often lead to a considerable segmental bone defect, which presents us with a major challenge. In this retrospective study, we would like to use case examples to show the indications and possibilities of bone defect repair with the free vascularised iliac crest graft
Aim: Material & Methods: Our patient population is very inhomogeneous. What all these patients have in common is the extensive bony defect situation. Implants can only temporarily compensate for more extensive bone defects left in place during fracture treatment. The consequences are a lack of bony consolidation, implant failure with implant loosening or fracture. Subsequent repeated osteosyntheses often do not lead to the desired success. In the context of infection situations, extensive debridement is often necessary with a residual bone defect. These patients have often undergone numerous previous operations and have a long history of suffering. In our cases, the local circulation situation and the size of the bone defect resulted in the indication for insertion of a vascularised iliac crest graft with additional osteosynthesis. The procedure was performed as part of the acute treatment as a 'fix and flap' technique, or secondarily. In some cases, soft tissue coverage was also required, which was performed in the same session using an ALT flap (single stage operation). Procedures of this type were performed on both the upper and lower extremities

Results: In our cases shown here, bony healing of the iliac crest graft was achieved. The lifting defect morbidity was low. A satisfactory functional result for the patient was achieved in all cases

Conclusions: The vascularised iliac crest graft offers an excellent reconstructive option in the context of extensive bone defects following fractures. It enables immediate mechanical support and blood circulation. Due to its inherent osteoconductive, osteoinductive and osteogenetic properties, it should be considered for segmental bone defects and biological failure of bony healing. Planning, the use of rigid internal fixation, careful soft tissue and bone reconstruction, and a precise microsurgical technique are crucial for a good outcome.

A-0288 SOCIOECONOMIC DISPARITIES AND THE SEVERITY OF GUNSHOT INJURIES IN ISRAEL

Ahmad Awwad[1], Layalee Abo Naser[1], Adi Givon[2], Arnona Ziv[2], Jennifer Moriatis Wolf[3], Jason A Strelzow[4], Israeli Trauma Group[2], Shai Luria[1]

[1]Department of Orthopedic Surgery, Hadassah Medical Center, Faculty of Medicine, Hebrew University of Jerusalem, Israel; [2]Gertner Institute of Epidemiology and Health Policy Research, Sheba Medical Center, Ramat Gan, Israel; [3]University of Chicago, Dept of Orthopaedic Surgery, IL, USA; [4]Washington University in St Louis, Dept of Orthopaedic Surgery, MO, USA

Introduction: Socioeconomic status is known to be correlated with gunshot violence.

Aim: Our aim is to examine the correlation between socioeconomic status (SES) and the severity of gunshot injuries in Israel.

Material & Methods: The Israeli National Trauma Registry includes all trauma patients admitted to all public hospitals nationwide. The data base was reviewed for all gunshot wound patients treated during a period of 4 years (2019 and 2022), which are all routinely admitted for hospital care. This period proceeded the current regional military conflict. Injury severity was assessed using the Injury Severity Score (ISS), and SES was categorized based on patients' home addresses using the Israeli Central Bureau of Statistics' index (a 10-scale defining lower or low-middle SES between 1-5). The Mantel-Haenszel Chi-Square Test and Pearson correlation coefficients, were used to analyze the correlation between SES and injury severity measures such as intensive care unit (ICU) admissions, length of hospital stay, and surgical interventions.

Results: A total of 1,908 patients were admitted for any gunshot injury during the study period. While individuals from lower SES backgrounds were the majority of patients (92% between SES grades 1-5), severe injuries were more prevalent in wealthier clusters (grades 6-10). The ISS was notably higher in individuals from the higher SES groups ($p < 0.0001$) as well as ICU admission ($p = 0.04$), injury to internal organs ($p=0.05$) and referral to rehabilitation facilities (0.04). Conversely, we found no the difference in mode of transport to the hospital or likelihood to undergo surgery between SES groups

Conclusions: This study demonstrates the complex relationship between socioeconomic status (SES) and gunshot injury patterns. While lower SES groups experience more frequent gunshot injuries, the injuries in these groups tend to be less severe. This can be attributed to differences in the relationship between the assailant and the victim, possibly as a means of terror and intimidation in lower SES populations in comparison with higher stake activity in wealthier communities. It may also be related to differences in criminal activity in different ethnic groups, lower SES populations with higher Arab representation in comparison with higher SES groups with more Jewish representation.

A-0289 WALANT VS. LAWIT (LOCAL ANAESTHESIA WITH TOURNIQUET)

Elisabeth Schellhaas, Senat Krasnici
Klinik für Unfall- und Wiederherstellungschirurgie, Johanniter-Krankenhaus Stendal, Germany

Introduction: For many decades, the tourniquet has been considered an indispensable tool in hand surgery. WALANT (wide awake local anaesthesia, no tourniquet) has become increasingly popular especially for minor hand surgery, the main advantage being increased patient comfort due to the absence of a tourniquet. Furthermore, participation of an anaesthetist is no longer necessary. But is visualisation of the delicate anatomic structures really as good as in an exsanguinated limb?
Aim: The aim of this study was to investigate operating time in minor standard procedures (i.e. carpal tunnel release and trigger finger release) as a surrogate parameter of technical difficulty in WALANT vs. LAWIT (local anaesthesia with tourniquet).
Material & Methods: We analysed all operations of isolated carpal tunnel release or isolated trigger finger release (1 finger) performed by a single surgeon between January 2017 and October 2024. Operations were selected from our hospital data base according to OPS codes. Combined surgeries with more procedures than either carpal tunnel or trigger finger release were excluded from analysis. From January 2017 until December 2021, carpal tunnel release was performed using Bier block anaesthesia. Trigger finger release was performed in local anaesthesia with an upper arm tourniquet. From January 2022, both operations were done in WALANT. We analysed operating time ("incision to suture") separately for both procedures depending on the method of anaesthesia, with and without participation of a surgical assistant, respectively.
Results: A total of 244 operations for carpal tunnel release (209 with Bier block, 35 with WALANT) and 180 operations for trigger finger release (155 with LAWIT, 35 with WALANT) were included. For carpal tunnel release, median operating time was 19 minutes with WALANT, 13 minutes with Bier block ($p<0.001$). For trigger finger release, median operating time was 8 minutes with LAWIT, 14 minutes with WALANT ($p<0.001$). Independently from the method of anaesthesia, participation of a surgical assistant reduced operating time by around 2-3 minutes in carpal tunnel release and in trigger finger release in WALANT, by around 0,5 minutes in trigger finger release with LAWIT, being statistically significant ($p<0.001$).
Conclusions: According to our data, mean operating time in minor hand procedures is increased in WALANT as compared with traditional local anaesthesia with a tourniquet, suggesting increased technical difficulty, possibly because of a more demanding operative field. Independently from the method of anaesthesia, participation of a surgical assistant reduced operating time.

A-0290 CORRECTIVE SURGERY FOLLOWING DISTAL RADIUS FRACTURE IN ELDERLY PATIENTS

Johannes Rois
AUVA Traumacenter Vienna Meidling, Vienna, Austria

Introduction: In most cases, distal radial fractures are treated conservatively in patients of advanced age. Studies have shown that the radiological result does not always correlate with the clinical result and that functionally satisfactory results can be achieved.
Aim: Are there indications for corrective surgery of a distal radius fracture that has healed in a malaligned position in advanced age?
Material & Methods: In this retrospective study, we would like to use case studies to show the indication for corrective surgery for malalignment at the distal end of the radius in advanced age. The most common complication after treatment of a distal radius fracture is healing in a malaligned position. This can lead to impairment of the radiocarpal and/or

radioulnar joint. At an advanced age, such malpositions are probably well tolerated due to the lower demands placed on the wrist. However, there are always patients who are unable to cope with the pain and functional limitations. The indication for corrective surgery was a shortening of the radius and a dorsal tilt.
Results: Corrective surgery was performed in all cases by using a volar approach and insertion of a bicortical bone block (from the iliac crest). The stable treatment with a stable-angle plate meant that correction losses could be avoided and bony healing was achieved. Postoperative follow-up treatment was carried out with a removable dorsal plastic splint. Good clinical and radiological results were achieved with this method.
Conclusions: If correctly indicated and correctly performed, corrective osteotomy of the distal radius improves wrist mobility and leads to significant pain relief. A good healing potential of the radius metaphysis with excellent remodelling is also found in patients of advanced age.

A-0291 EFFICACY AND SAFETY OF GABAPENTINOIDS IN TREATMENT OF CARPAL TUNNEL SYNDROME. A SYSTEMATIC REVIEW AND META-ANALYSIS

Saara Raatikainen[1], Kati Jaatinen[1,2], Teemu Karjalainen[2,3], Vieda Lusa[2]
[1]Finnish Centre for Evidence-Based Orthopaedics (FICEBO), Department of Orthopaedics and Traumatology, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; [2]Hospital Nova of Central Finland, Wellbeing Services County of Central Finland, Jyväskylä, Finland; [3]Department of Hand Surgery and Microsurgery, Tampere University Hospital, Tampere, Finland

Introduction: Off-label use of gabapentinoids for carpal tunnel syndrome (CTS) is increasing despite limited evidence of efficacy and known risks of adverse effects.
Aim: This systematic review and meta-analysis aimed to synthesise the evidence of the benefits and harms of oral gabapentinoids in treating CTS.
Material & Methods: We searched MEDLINE and Cochrane Central Register of Controlled Trials for randomized controlled trials. Based on the search results we formed three comparisons assessing the effect of oral gabapentinoid interventions against 1) placebo (primary comparison), 2) open label no-treatment (with co-interventions in both arms) or 3) splinting. The primary outcome was symptom severity. The secondary outcomes were pain, function, clinical improvement, health-related quality of life, adverse effects and need for surgery. We adhered to the Cochrane and GRADE methodology throughout conducting this systematic review, and meta-analysis.
Results: Gabapentinoids probably do not improve CTS symptoms (moderate certainty) compared with placebo. The benefit was 0.08 points better (95% confidence interval (CI) 0.33 better to 0.17 worse; 2 studies, 286 randomized participants) expressed on Boston Carpal Tunnel Questionnaire Symptom Severity Scale (1 to 5 points, lower is better; minimal clinically important difference 1.14 points) with gabapentinoids at eight weeks. Secondary comparison to no treatment aligned with this finding. Gabapentinoids probably cause more fatigue (risk ratio (RR) 1.67 (95% CI 1.06 to 2.63)) and may cause more dizziness (RR 1.96 (95% CI 0.93 to 4.13)) compared to placebo. At short term, and when compared to no-treatment, gabapentinoids may provide minor benefits for pain but not for hand function.
Conclusions: Current evidence does not support the use of oral gabapentinoids for treating CTS. There were no clinically important benefits in symptom relief when compared to placebo or no-treatment, and gabapentinoids caused adverse effects, particularly fatigue and maybe also dizziness.

A-0292 TREATMENT OF SCARRED PERIPHERAL NEUROPATHIC PAIN BY NEUROMA RESECTION AND PROXIMAL INTRAMUSCULAR OR INTRAOSSEOUS TRANSPOSITION: A GOOD SOLUTION TO A COMPLEX PROBLEM

JC Márquez, M Olmeda,R Mascaraque,M Flores
Infanta Elena Hospital, Valdemoro, Madrid, Spain

Introduction: Chronic peripheral neuropathic pain due to scar neuromas is a challenge for orthopedic surgeons, especially in the upper limb.There are many surgical techniques for its treatment, with discreet results.
Aim: To assess the results of treatment by resection of neuromas and proximal transposition of the nerve with burial in muscle or bone.
Material & Methods: We present a series of 30 patients with diagnosis of peripheral neuropathic pain located in a scar and caused by neuroma of sensory or mixed nerves.
minimum follow-up of one year
Eighty percent are smokers
Half of the cases affect the sensory or superficial branch of the radial nerve.
Average of three previous surgeries and specific procedures performed in the pain unit (capsaicin patch/nerve blocks/nerve radiofrequency/intravenous local anesthetics)
In the surgical technique, a prior mapping of the cutaneous area with sensory alteration is performed, the neuroma or neuromas in the scar are resected and a proximal transposition is performed, burying the end of the nerve in a bone or muscle without tension in the different arcs of movement of the limb.
The intensity of the pain is assessed according to the visual scale (0-10) before and after surgery, as well as the need for analgesics and anxiolytics, the impact on nighttime rest and the functional impact on the use of the wrist or hand.
Results: average reduction of six points on the visual scale
All patients reduced the need for analgesics and anxiolytics, regaining nighttime rest and use of the limb.
The Tinel sign was negative in the operated area and in the recipient area.
We had no cases of wound infection, only two cases of dehiscence in the previous scar area.
20 percent of cases reported phantom touch and 30 percent of patients reported that anesthesia caused them discomfort in the first six months.When asked if they would undergo the same operation again, 90% of patients answered affirmatively.
Conclusions: In our experience, this is an effective therapeutic alternative in complex cases that cause intense neuropathic pain, functional alteration and impact on the quality of life of these patients. It is essential to inform the patient of the objectives of the surgery and its consequences on the sensory territory. A neuromodulatory therapy is of great help.

A-0293 INFLUENCE OF CUP POSITION ON COMPLICATION RATES AND OUTCOMES IN TRAPEZIOMETACARPAL ARTHROPLASTY

Albert Pons-Riverola, Marta Cuenca-Llavall, Mireia Arlandez, Laura Rey, Jordi Saus
Althaia Xarxa Assistencial Universitària de Manresa, Manresa, Barcelona, Spain

Introduction & Aim: The position of the cup component in trapeziometacarpal (CMC) arthroplasty may influence postoperative outcomes. This study aims to evaluate how the inclination angle and centralization index of the trapezium cup affect function and complications in patients undergoing CMC arthroplasty.
Material & Methods: This retrospective observational study included patients who underwent carpometacarpal (CMC) joint arthroplasty from 2015 to 2023 at a single institution. Functional outcomes were evaluated using the QuickDASH

questionnaire for disability, the Visual Analog Scale (VAS) for pain, thumb abduction angle, and Kapandji opposition scale. Radiographic measurements included the cup inclination angle, defined as the angle between the anterior proximal trapezial surface and the cup's surface, and the cup centralization index, calculated as the ratio of the cup's distance to the radial cortex versus the ulnar cortex of the trapezium. Radiographic measurements were independently performed by two observers, and inter-rater reliability was assessed by calculating the intraclass correlation coefficient (ICC).
A statistical analysis was conducted to evaluate the influence of cup position on patient outcomes.
Results: The study included 217 CMC arthroplasties (Maia-Lépine) with an average follow-up of 3.5 years (±1.9). The mean patient age was 60.4 ± 7.7 years, with 77.4% female. The reintervention rate was 3.7%, primarily due to major complications (3 dislocations [1.4%] and 5 cases of loosening [2.3%]). Functional outcomes included an average QuickDASH score of 34.7 ± 25.5, VAS pain score of 1.7 ± 2.0, Kapandji score of 9.3 ± 1.3, and thumb abduction of 66.2° ± 10.6. Implant survivorship at 3 years was 96.4%.
Radiographic analysis showed a mean cup inclination of 7.4° ± 5.8 and a mean centralization index of 1.04 ± 0.70. The intraclass correlation coefficient (ICC) between observers was 0.92 (CI 0.90-0.94) for both centralization index and cup angle. No significant correlation was found between inclination angle or centralization index and functional or pain outcomes. However, patients requiring reintervention had a significantly lower centralization index (0.55 ± 0.36) than those without reintervention (1.06 ± 0.71) ($p = 0.032$)
Conclusions: Cup inclination was not correlated with poor functional outcomes in CMC arthroplasty. However, extreme decentralization of the trapezium cup is associated with a higher rate of major postoperative complications. Optimal centralization of the cup may be a key factor in reducing the risk of reintervention and improving implant survivorship.

A-0294 LESSONS LEARNED: IATROGENIC NERVE LESIONS IN PEDIATRIC UPPER EXTREMITY FRACTURES

Martin Aman, Ulrike Schnick, Julia Glaser, Leila Harhaus, Richarda Böttcher
Department of Hand, Replantation, and Microsurgery BG Klinikum Unfallkrankenhaus Berlin and Chair of Hand, Replantation, and Microsurgery at the Charité University Medicine Berlin

Introduction: Iatrogenic nerve lesions pose a serious risk in pediatric upper extremity fractures, especially in displaced supracondylar humeral fractures, which are associated with nerve injuries in up to 11% of cases. While many lesions resolve spontaneously, some result in permanent functional impairment.
Aim: This study aims to elucidate the specific challenges and outcomes of iatrogenic nerve injuries in children, providing a comprehensive overview of diagnostic strategies, treatment approaches, and patient outcomes.
Material & Methods: We analyzed pediatric cases of upper extremity fractures with associated iatrogenic nerve lesions treated between January 2016 and November 2024. Data from 35 cases included fracture type and management, affected nerves, diagnostic modalities, and therapeutic interventions, as well as treatment timelines and outcomes.
Results: Among the cases, 22 children presented with displaced supracondylar fractures, 3 with Monteggia-like lesions, 2 with forearm shaft fractures, and 2 with elbow dislocations. Fracture management varied; 15 cases involved isolated the ulnar nerve, 5 involved the radial nerve, and 11 involved the median nerve. Four had combined nerve lesions. Neurosonography and electromyography were key diagnostic tools, although 13 cases experienced delayed recognition of nerve damage, sometimes detected up to six months postoperatively. Surgical intervention, including neurolysis and nerve grafting, was necessary for severe cases; conservative management was appropriate for others.
Conclusions: In total, 63% of these cases, required surgery, underscoring the importance of diligent postoperative assessments and early intervention algorithms to mitigate long-term impairment in pediatric patients. Therefore we developed an algorithm to support treating surgeons and accelerate treatment.

A-0295 EVALUATING PATIENT SATISFACTION WITH WALANT FOR HAND SURGERY: A COMPREHENSIVE QUESTIONNAIRE-BASED STUDY

Ahmed Elsaftawy, Szymon Manasterski, Michał Chęciński, Paweł Stajniak, Maja Smorąg, Piotr Węgrzyn, Jędrzej Króliński, Marcin Syrko, Marta Jagosz
St. Jadwiga Śląska Hospital in Trzebnica, Poland

Introduction: There has been an increase in the popularity of the Wide-Awake Local Anesthesia No-Tourniquet (WALANT) procedure for various upper limb surgeries.
Aim: The present study aims to conduct a comprehensive analysis of the satisfaction levels of 106 patients, considering factors such as age, gender, comorbidities, and the specific procedures they underwent.
Material & Methods: The present study was a retrospective cohort study conducted to analyze the overall satisfaction of a cohort of 106 patients who underwent various surgical procedures of the hand between 2018 and 2023. The satisfaction was assessed with a questionnaire comprising 13 questions/statements adjusted to a standard Swiss grading system (from 1 = I strongly agree to 6 = I strongly disagree).
Results: Overall satisfaction with WALANT was high, with most patients expressing positive experiences. Patients with hypertension reported similar satisfaction levels compared to those without, while diabetic patients experienced significantly higher anxiety levels during the procedure ($p > 0.05$).
Conclusions: WALANT exhibits versatility as an anesthesia choice, demonstrating efficacy in both routine and complex hand surgeries. Our survey-based study reveals a high satisfaction level across diverse procedures. When assessing the correlation between WALANT satisfaction and patient comorbidities, hypertension displayed no significant impact, while diabetic patients reported heightened anxiety. Importantly, patient satisfaction remained consistently high even within the subgroup with comorbidities. Our results underscore WALANT's reliability in upper limb surgery, showcasing its usefulness and positive outcomes across a broad range of patients and surgical procedures.

A-0296 PATIENT-REPORTED OUTCOME MEASURES (PROMS) IN HAND SURGERY: ENHANCING QUALITY ASSESSMENT AND INFORMED DECISION-MAKING IN EUROPE

Martin Aman[1], Julia Glaser[1], Anna Pennekamp[2], Cosima Prahm[1], Piotr Czarnecki[3], Brigitte Van der Heijden[4], Leila Harhaus[1]
[1]Department of Hand, Replantation, and Microsurgery BG Klinikum Unfallkrankenhaus Berlin and Chair of Hand, Replantation, and Microsurgery at the Charité University Medicine Berlin; [2]Department of Handsurgery, Peripheral Nerve Surgery and Rehabilitation, Clinic of Plastic and Reconstructive Surgery, Burn Center, BG Trauma Center Ludwigshafen, Department of Hand- and Plastic Surgery, University of Heidelberg, Heidelberg, Germany; [3]Traumatology, Orthopaedics and Hand Surgery Department, Poznan University of Medical Sciences, Poland; [4]Division of Plastic Reconstructive and Hand surgery, Jeroen Bosch Hospital 's-Hertogenbosch and Radboudumc, Nijmegen, The Netherlands

Introduction: The European healthcare system emphasizes value-based care to enhance outcomes and control costs. PROMs are crucial for assessing function and satisfaction in hand surgery
Aim: This study evaluates PROM use across Europe, focusing on diversity and language validation
Material & Methods: A comprehensive database search for hand-specific PROMs assessed availability for all official languages in Europe focusing on transculturally adapted and validated versions of the DASH, MHQ, PRWE, and BCTQ questionnaires
Results: The study identified 47 European countries with 41 unique languages. DASH is the most available PROM, translated in 41 languages. MHQ is available in 20 countries, PRWE in 31, and BCTQ in 30

Conclusions: Availability varies significantly by language.
Significant gaps in hand specific PROM availability exist across Europe. While DASH is widely available, dissemination and cultural adaptation of MHQ, PRWE, and BCTQ are needed. To support countries in translating and validating such questionnaires, we provide an exemplary Spirit checklist as supplementary material.

A-0297 DIGITAL EYE: DEEP LEARNING FOR PEDIATRIC DISTAL RADIAL FRACTURE CLASSIFICATION

Nathan Chaclas, David P VanEenenaam Jr., Vineet M Desai, Joseph Logan, Scott J Mahon, John "Jack" M Flynn, Apurva S Shah
Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

Introduction: Distal radial fractures (DRFs) are some of the most common injuries in children and adolescents, and these injuries often involve the physis. Diagnostic accuracy is challenging, as these patients frequently do not present to a pediatric orthopaedic surgeon or a pediatric musculoskeletal radiologist for initial evaluation. Therefore, the development of tools to help classify DRFs by physeal involvement should be explored.
Aim: In this investigation, we aim to fine-tune a convolutional neural network (CNN), the EfficientNet image classification model family, to classify skeletally immature DRF radiographs by involvement of the physis.
Material & Methods: We conducted a retrospective study using DRF radiographs identified from a database collected within a single large tertiary-care center. The database included skeletally immature patients aged 4-18 who presented with DRFs. All fractures were classified with respect to involvement of the physis by an orthopaedic surgeon's ground truth diagnosis. We fine-tuned the EfficientNet family of models on the dataset and calculated the accuracy, loss, precision, recall, and F1-score of the classification. We plotted the receiver operating characteristic (ROC) curve and computed the area under the curve (AUC) of the model. To interpret the model's predictions, we used Grad-CAM, a technique that visualizes the gradient-weighted class activation maps of the convolutional layers, to highlight the regions of the radiographs that the model learned to focus on for the classification task.
Results: Our database returned 2103 radiographs comprised of anteroposterior and lateral views from 1082 patients after exclusion criteria were applied. This consisted of 425 views of 203 physeal fractures and 1678 views of 879 non-physeal fractures. The best model was EfficientNet-B2, which achieved a validation accuracy of 84% and a test accuracy of 84%. The model had a high precision (81%), recall (89%), and F1-score (.86) on the test set
Conclusions: We demonstrate that fine-tuning an EfficientNet model can achieve high accuracy in classifying DRF radiographs by physeal involvement. We have also shown that Grad-CAM can provide some interpretability and transparency for the model's predictions, highlighting the regions of interest and the potential sources of error. Our study suggests that CNNs can be a powerful tool for fracture classification, and that EfficientNet is a promising architecture for this task. Future work should include expanding the dataset with more diverse and balanced samples, as well as testing the model on different views and fracture patterns.

A-0298 COMPARISON OF CLINICAL OUTCOMES OF CORTICOSTEROID INJECTION VS. NIGHT SPLINT FOR NON-OPERATIVE TREATMENT OF CARPAL TUNNEL SYNDROME: A META-ANALYSIS OF RCTS

Alexandros Koskiniotis, Aikaterini Sourmenidi, Theodoros Mylonas, Vithleem Lanara, Nikolaos Stefanou, Efstratios Athanaselis, Sokratis E. Varitimidis
University Hospital of Larissa, Orthopaedic Department, University of Thessaly, Greece

Introduction: Carpal Tunnel Syndrome (CTS) is the most common compressive neuropathy in the hand, primarily due to restricted anatomical space and repeated compression of the median nerve by the flexor tendons.
Aim: This meta-analysis aimed to compare the functional outcomes of non-operative CTS treatments, specifically corticosteroid injection versus daily night splint use.
Material & Methods: A systematic review was conducted following PRISMA guidelines, with the primary outcome defined as the improvement measured by the Boston Carpal Tunnel Questionnaire (BCTQ) at six weeks and six months post-treatment. Two primary patient groups were analyzed based on intervention type.
Results: Six randomized controlled trials (RCTs) were included, with a total of 604 patients. Both groups demonstrated significant symptomatic improvement at a minimum follow-up of six weeks (p-value < 0.05). Meta-analysis revealed that BCTQ improvement was significantly greater in patients receiving corticosteroid injections at six weeks: $Z = 3.34$ ($P = 0.0008$), with an effect size of -0.44 [95% CI: -0.70, -0.18]. However, no significant clinical or statistical differences were observed between groups at the six-month evaluation: $Z = 1.27$ ($P = 0.20$), effect size -0.77 [95% CI: -1.95, 0.41].
Conclusions: This systematic review suggests that corticosteroid injections may provide more rapid symptom relief in CTS patients than night splint use. However, there appears to be no long-term difference between the two conservative treatments, indicating both are viable non-operative options depending on the treatment goal (immediate vs. sustained relief).

A-0299 CORONAL REMODELING OF PEDIATRIC DISTAL RADIUS FRACTURES

Vineet M Desai, Scott J Mahon, Varshini Babu, Apurva S Shah
Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

Introduction: Distal radius fractures (DRFs) have significant remodeling potential due to their proximity to the distal radial physis, and although remodeling in the sagittal plane has been well-reported, there is still considerable debate on how much angulation is acceptable in the coronal plane.
Aim: With this investigation on the rate of coronal remodeling in a sample of children with distal radius fractures, we aimed to determine the maximum allowed "acceptable" coronal angulation and hypothesized that the coronal remodeling rate will be greater than 2 degrees per month.
Material & Methods: All DRFs with at least four months of radiographic follow-up at a single tertiary-care children's hospital from 2012-2023 were reviewed. Any DRFs with greater than 10 degrees of residual coronal angulation in a child with at least two years of remaining skeletal growth were included. Children with open fractures, physeal fractures, or fractures treated with instrumentation were excluded. Patient demographic, clinical, and radiographic data were recorded. The coronal remodeling rate was calculated as the difference between the maximum post-reduction coronal angulation and final follow-up angulation divided by the time between the radiographs. Each patient's rate was then averaged to find the overall estimate of the monthly coronal remodeling rate in skeletally immature children.
Results: 1601 patients with DRF were screened, yielding a final cohort of 60 patients (73.3% male) with coronal plane

angulation meeting inclusion criteria. The mean age at injury was 7.6 ± 3.2 (range: 1.6-14.3) years. Thirty-nine (65%) patients had at least one closed reduction attempt. The mean follow-up time was 7.2 months. The mean distance from the fracture to the physis was 1.9 ± 0.6cm. The mean maximal coronal translation was 3.4 ± 2.0mm, and the mean peak coronal angulation was 21.6 ± 6.1 degrees. At final follow-up, the mean coronal angulation was 8.2 ± 5.2 degrees, and no patients had residual translation exceeding 10%. The mean observed rate of coronal angular remodeling was 2.5 degrees per month (95% CI: 2.2-2.8)

Conclusions: Pediatric distal radius fractures display greater remodeling than historically reported. Coronal remodeling occurs at a rate of approximately 2.5 degrees per month, suggesting that at least 20 degrees of coronal plane angular deformity is likely acceptable in skeletally immature children. An updated understanding of coronal plane remodeling potential can help limit the need for unnecessary reductions or surgical interventions in children.

A-0300 IMPACT OF ANXIETY AND DEPRESSION ON OUTCOMES FOLLOWING TRAPEZIOMETACARPAL CMC ARTHROPLASTY: A RETROSPECTIVE ANALYSIS OF 217 CASES

Albert Pons-Riverola, Marta Cuenca-Llavall, Mireia Arlandez, Laura Rey, Jordi Saus
Althaia. Xarxa Assistencial Universitària de Manresa, Manresa, Barcelona, Spain

Introduction & Aim: This study investigates the influence of anxiety and depression on postoperative functional outcomes following carpometacarpal (CMC) arthroplasty, aiming to better understand how mental health impacts recovery in this patient population.

Material & Methods: A retrospective analysis was conducted on patients who underwent CMC arthroplasty at a single center from 2015 to 2023. Functional outcomes, pain levels, and thumb range of motion were assessed using the Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) score, Visual Analog Scale (VAS), thumb abduction angle, and Kapandji score. Additional data collected included postoperative complications, psychiatric history, and mental health assessments using the Hospital Anxiety and Depression Scale (HADS) for anxiety and depression symptoms. Functional outcomes were analyzed in relation to psychiatric history and HADS-assessed anxiety and depression scores to evaluate potential correlations.

Results: A total of 217 CMC arthroplasties using the Maia-Lépine technique were included, with a mean follow-up of 3.5 years (minimum one year). The cohort's mean age was 60.4 ± 7.7 years, with 77.4% female. Among the patients, 31.0% regularly used antidepressant medication, and 4.2% had previously consulted the center's psychiatric services. Major complications occurred in 3.7% of cases, while minor complications were observed in 7.3% (notably 4 cases of persistent prosthesis pain and 2 cases of complex regional pain syndrome). Functional outcomes included a mean QuickDASH score of 34.7 ± 25.5, VAS score of 1.7 ± 2.0, Kapandji score of 9.3 ± 1.3, and thumb abduction of 66.2º ± 10.6. Mean HADS scores were 5.8 ± 4.6 for depression and 8.3 ± 5.0 for anxiety. Both HADS depression and anxiety scores showed statistically significant correlations with pain levels ($p < 0.001$). Higher anxiety and depression scores were also significantly associated with reduced functional outcomes ($p < 0.001$), with poorer function observed in patients on antidepressants or with a history of psychiatric consultations

Conclusions: Anxiety and depression symptoms are strongly associated with increased pain and diminished functional recovery following CMC arthroplasty. These findings highlight the need for comprehensive perioperative management addressing mental health in order to optimize outcomes in CMC arthroplasty patients

A-0301 GROWTH ON HOLD: UNCOVERING RISK FACTORS FOR PHYSEAL ARREST FOLLOWING PEDIATRIC DISTAL RADIUS PHYSEAL FRACTURE

Varshini Babu, Sulagna Sarkar, Nathan Chaclas, Scott J Mahon, Lee S Haruno, Divya Jain, Amanda Pang, Apurva S Shah
Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

Introduction: Physeal arrest following pediatric distal radial fracture can lead to deformity and functional impairment. While the incidence of physeal arrest has been previously reported, specific risk factors are less understood.
Aim: This investigation sought to determine the rate of physeal arrest and identify associated risk factors in a large cohort.
Material & Methods: A retrospective cohort study of children with distal radial physeal fractures treated non-operatively from 2010-2024 at a single children's hospital was conducted. Patient records and radiographs were reviewed, and fractures were classified by Salter-Harris (SH) type. Physeal arrest was defined as complete or partial closure of the physis on radiographs. Patients without a minimum of 6-month radiographic follow-up were excluded. Descriptive analysis was performed to determine the incidence of physeal arrest, and Wilcoxon Rank Sum tests, Fisher tests, and logistic regression analysis were used to identify associated risk factors.
Results: 536 patients (38.5% female) with a median age at injury of 9.5 years were included. The overall incidence of physeal arrest was 6.9% (38/549). This varied significantly by SH type ($p=0.003$), with 2.9 times greater odds of arrest following type II fractures compared to type I fractures. The odds of physeal arrest were 5.9 times greater among older patients (age >10; 9.5% vs. 1.8%, $p=0.003$). There were also significantly greater odds of physeal arrest among patients with greater initial coronal and sagittal angulation and translation. Of note, patients with an initial sagittal translation >5% had 7.2 times greater odds of physeal arrest (13.0% vs. 2.1%, $p=0.009$). Multiple attempts (≥ 2) at closed reduction also increased the odds of physeal arrest (OR=7.0, $p<0.001$). In a multivariate model, only age (OR=1.3, $p=0.003$) and initial sagittal translation >5% (OR=4.5, $p=0.001$) predicted physeal arrest after controlling for other variables
Conclusions: The overall incidence of physeal arrest following distal radius fractures was 6.9%, which is similar to historic studies in the literature. Older patient age and sagittal translation were newly identified and clinically significant risk factors for physeal arrest. Multiple closed reduction attempts increase the odds of physeal arrest by almost 7-fold, which emphasizes the importance of minimizing iatrogenic trauma. Patients older than 10 years and fractures with greater than 5% sagittal translation would most benefit from routine radiographic follow-up to detect physeal arrest early.

A-0302 LONG-TERM OUTCOMES AFTER RADIALIZATION AND VASCULARIZED METATARSOPHALANGEAL JOINT TRANSFER FOR RADIAL LONGITUDINAL DEFICIENCY

Niko Kämppä[1,2], Petra Grahn[2], Pasi Paavilainen[3], Sina Hulkkonen[1], Yrjänä Nietosvaara[2,4], Jarkko Jokihaara[5]
[1]Department of Hand Surgery, Helsinki University Hospital and University of Helsinki, Finland; [2]Department of Pediatric Orthopedics and Traumatology, New Children's Hospital, HUS Helsinki University Hospital, University of Helsinki, Finland; [3]Pihlajalinna Hospital, Tampere, Finland; [4]Department of Pediatric Surgery, Kuopio University Hospital, Kuopio, Finland; [5]Tampere University Hospital and Tampere University, Finland

Hypothesis: Zadialization and reconstruction with a vascularized transfer of the metatarsophalangeal joint II (MTP II transfer) produce similar long-term outcomes with relatively low patient rated dysfunction in radial longitudinal deficiency (RLD).
Methods: Patients with RLD who were operatively treated at tertiary referral hand surgery clinics in the Tampere University Hospital, Finland, or at the Helsinki University Hospital, Finland, between March 1990 and April 2017 were identified from the medical records. The method of surgical treatment was determined geographically by the catchment area

of the units. Patients treated in Tampere underwent a MTP II transfer while patients in Helsinki were treated with a radialization procedure.
Patients with Bayne and Klug type III (partial absence of radius) or type IV (total absence of radius) and age 10-30 years at follow-up were included.
Long-term outcome evaluation included PRWE, DASH and patient rated assessments of function and cosmetic result on a visual analog scale (VAS). Standard forearm posteroanterior and lateral view radiographs were taken and wrist position at rest and active range of motion (AROM) were measured at follow-up.
Age and follow-up times are reported as median and range. Outcomes reported as medians with 95% confidence intervals. Formal comparative statistical analyses between groups were not performed due to the small sample size.
Results: We evaluated 28 participants (67% males) with 32 affected upper limbs. 17 limbs were treated with a MTP II transfer and 15 with radialization. 4 participants had bilateral RLD. 3 limbs in the radialization group and 5 in the MTP transfer group were Bayne and Klug type III and the rest were type IV. Median age at follow-up was 13.6 (range 11.4-19.6) after radialization and 16.8 (range 10.8-33.1) after MTP transfer and follow-up times 11.7 (range 6.9-39.9) and 13.5 (range 4.8-39.9) respectively.
PRWE showed slightly less dysfunction (radialization: 24 (15-34); MTP-transfer: 11 (8.5-22.5)) in patients treated with MTP transfers but the difference did not exceed the previously reported minimum clinically important difference (MCID). DASH (radialization: 19.2 (16.4-39.7); MTP-transfer: 19 (6.8-25.0)) and function VAS (radialization: 7.0 (4.8-9.2); MTP-transfer: 8.0 (6.0-8.5)) scores were similar after both treatments. The cosmetic VAS was better after radialization (radialization: 8.0 (7.0-10.0); MTP-transfer 5.0 (2.6-6.0)). Wrist extension-flexion AROM was wider in the MTP II transfer group (MTP-transfer: 90 degrees (70-90); radialization: 50 (30-70)). The median radiographic hand-forearm-angle was 22 degrees (13-51) after radialization and 32 (19-43) after MTP-transfer. When ulnar length was compared with the unaffected side in participants with unilateral RLD both treatments seemed to yield similar results (radialization: 58%, 43%-68%; MTP-transfer 61%, 60-62%).
Conclusions: Radialization and MTP II transfer seem to produce similar functional long-term outcomes. The cosmetic outcome seems better after radialization surgery and wrist extension-flexion AROM after MTP II transfer. Hand-forearm -angle or ulnar length compared to the healthy side did not seem to be influenced by treatment choice.

A-0303 IN THE ERA OF ADVANCED MICROSURGERY, IS THERE STILL A PLACE FOR PEDICLED ABDOMINAL FLAPS?

Marta Jagosz[1], Paweł Stajniak[1], Maja Smorąg[1], Michał Chęciński[1], Patryk Ostrowski[2,3], Piotr Węgrzyn[1], Jędrzej Króliński[1], Szymon Manasterski[1], Ahmed Elsaftawy[1]
[1]Department of Plastic and Hand Surgery, St Jadwiga Śląska Hospital, Trzebnica, Poland; [2]Department of Anatomy, Jagiellonian University Medical College, Kraków, Poland; [3]Youthoria, Youth Research Organization, Kraków Poland

Background: The pedicled abdominal flap, established in the 1970s, is still widely used for upper extremity reconstruction, yet it carries drawbacks like two-stage procedure, prolonged hospitalization and delayed physiotherapy
Aim: We present our experience in the free-style pedicled abdominal flap as a solid option for soft tissue coverage in upper extremity defects, particularly for patients with limited reconstructive options.
Materials and methods: Total of 20 patients who underwent upper extremity reconstruction with free-style pedicled abdominal flap from January 2019 to June 2024 were analized. We have included cohort that was not feasible for free flaps or alternative methods of reconstruction. The aetiology of tissue damage was injury, tissue necrosis, high-voltage burn and thermal- burn injury

Results: Soft tissue coverage was successfully achieved using 11 single, 2 double, 1 three-pedicled, 1 five-pedicle flaps as well as 4 tunneled flaps. Complications included two cases of marginal flap necrosis, two of partial flap necrosis and 2 of complete flap necrosis as well as one delayed union in case of pedicled abdominal flap with vascularised bone graft. Surgical site infection occurred in 2 cases. No donor site complications were observed apart from one paediatric patient who required split thickness skin graft. No long-term joint stiffness was observed.
Conclusion: Free-style pedicled abdominal flaps provide a solid and versatile approach for upper extremity soft tissue reconstruction. Taking into account the aetiology and comprehensiveness of the injury, they might be a suitable therapeutic option especially for challenging cases where alternative options are limited.

A-0304 WHAT A NERVE SURGEON CAN LEARN FROM THE BONE SURGEON? IMPLEMENTATION OF THE DIAMOND CONCEPT FOR PERIPHERAL NERVE REGENERATION

Andrii Lysak[1,2], Lars B Dahlin[3,4,5]
[1]SI "Main Medical Clinical Center of MIA of Ukraine", Kyiv, Ukraine; [2]SI "Institute of Traumatology and Orthopedics of the NAMS of Ukraine, " Kyiv, Ukraine; [3]Department of Translational Medicine – Hand Surgery, Lund University, Malmö, Sweden; [4]Department of Hand Surgery, Skåne University Hospital, Malmö, Sweden; [5]Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden

Introduction: Peripheral nerve regeneration and achieving a functional result after nerve repair or nerve reconstruction are still a challenging topic. Clinical implementation of achievements in basic science is in many cases difficult, expensive, and hardware-demanding. On the other hand, there is a boom in the development of artificial nerve conduits but still with a debatable clinical outcome after nerve reconstruction for injured mixed nerves. In our opinion, one of the reasons for poor outcomes can be the absence of a clear clinical understanding of the main factors that affect nerve regeneration despite a substantial number of published articles from experimental projects. We discovered that the "Diamond concept of bone healing" has a lot in common with the modern understanding of peripheral nerve regeneration. With some changes, it can be implemented as a concept that includes the main factors of nerve regeneration and can help to highlight the main problems in this area
Aim: To present our thoughts and vision of the peripheral nerve regeneration problem and initiate the discussion between specialists to crystalize the concept.
Discussion: The "Diamond concept of bone healing" is a conceptual framework of what is essential for a successful bone healing response. The concept helps to assess and plan the management of non-union of fractures. It refers to the availability of osteoinductive mediators, osteogenic cells, an osteoconductive matrix (scaffold), optimum mechanical environment, adequate vascularity, and addressing any existing comorbidities of the host.
In the same way, when we consider the factors that influence peripheral nerve regeneration after repair or reconstruction of a traumatic nerve injury, we reflect about a number of elements, such as up- and down-regulation of a variety of growth, survival, and extracellular matrix factors, the inflammatory response with involvement of macrophages, survival, proliferation and migration of Schwann cells, the consideration of outgrowth of motor and sensory nerve fibers, the condition and placement of the nerve scaffold (e.g., group of sural nerve grafts, nerve allograft, or a variety of artificial grafts), the quality of nerve-graft or nerve-nerve connection (e.g., quality of nerve suture, tension on the nerve and the nerve suture, use of fibrin glue or vein to seal the suture area etc.), adequate vascularity of the surrounding tissue and nerve graft (particularly for larger grafts), and patient comorbidities (e.g., cardiovascular diseases, diabetes, hormonal disorders, smoking). The idea is that combining all these factors into one concept gives an understanding of what surgeons should achieve during the operation, and what scientists should implement in the development of artificial grafts

Conclusions: Implementation of the Diamond concept for peripheral nerve regeneration can ease the process understanding of clinical requirements for better outcome after nerve repair or nerve reconstruction, and the scientific search in creation of an optimal artificial nerve graft.

A-0305 ASSESSING GUIDEWIRE AND CUP POSITIONING ACCURACY IN THUMB CMC JOINT PROSTHESES: IMPACT OF SURGICAL EXPERTISE

Simeon Daeschler[1,2], Leila Harhaus[1,2,3,4], Benjamin Panzram[1]

[1]Heidelberg University Hospital, Center for Orthopaedics, Heidelberg, Germany; [2]BG Klinikum Ludwigshafen, Department for Hand, Plastic and Reconstructive Surgery, Germany; [3]BG Klinikum Unfallkrankenhaus Berlin, Department of Hand-, Replantation- and Microsurgery, Germany; [4]Charité Universitätsmedizin Berlin, Department of Hand-, Replantation- and Microsurgery, Germany

Introduction: The use of thumb carpometacarpal (CMC 1) joint prostheses for advanced CMC joint arthritis has grown significantly, attributed to the success of recent prosthesis generations, which demonstrate improved functional outcomes and reduced complication rates. Achieving precise alignment of the prosthesis cup parallel to the proximal joint surface of the trapezium is critical to maintaining stability and preventing dislocation. However, this alignment is a challenging surgical task, especially for surgeons new to the procedure. Errors in guidewire positioning and cup placement can occur, leading to intraoperative adjustments and potential complications.
Aim: To evaluate the accuracy of guidewire and cup positioning in thumb CMC joint prosthesis implantation and to compare outcomes between inexperienced and experienced surgeons.
Material & Methods: This study analyzed radiological data from 65 thumb CMC joint prosthesis implantations, assessing deviations in guidewire and cup positioning by both novice and experienced surgeons.
Results: Both, inexperienced and experienced surgeons achieved precise guidewire positioning with mean deviations of less than 2.2°. Inexperienced surgeons showed significantly larger cup deviations in the dorsopalmar and lateral view (7.6 $\pm$ 6.1° and 7.3 $\pm$ 5.9°) compared with experienced surgeons (3.6 $\pm$ 2.7° and 3.6 $\pm$ 2.5°; $p = 0.012$, $p = 0.017$). Additionally, deviations in cup positioning by inexperienced surgeons tended to oppose the initial direction of the guidewire ($p < 0.0038$).
Conclusions: The study underscores the challenges in accurately positioning the prosthesis cup based on surgical experience, highlighting that even with well-placed guidewires, substantial cup misalignments occur more frequently among less experienced surgeons. This suggests a need to reconsider the reliability of guidewire placement alone and may call for additional tools or training to enhance cup alignment precision in thumb CMC joint prosthesis implantation.

A-0306 ARTHROSCOPIC SCAPHOTRAPEZIOTRAPEZOID ARTHRODESIS FOR STT OSTEOARTHRITIS: A PROSPECTIVE-EVALUATED MULTICENTER STUDY OF 10 CASES

Chul Ki Goorens[1], Louis Thielman[2], Bert Vanmierlo[2]

[1]International Wrist Center Tienen, Regionaal Ziekenhuis Tienen, Tienen, Belgium; [2]AZ Delta Roeselare, Roeselare, Belgium

Introduction: STT osteoarthritis is a common cause of wrist pain. When conservative treatments fail, surgery may be considered. Available options include trapeziectomy, resection arthroplasty, implant arthroplasty, and arthrodesis. Traditionally, STT fusion is performed via an open procedure, which has a non-union rate of 7% and a 10% risk of reoperation. Arthroscopy is theoretically less invasive, preserving intercarpal ligaments and vascular supply, potentially reducing the rates of non-union and wrist stiffness.

Aim: This prospective, multicenter study describes the results of 10 cases of arthroscopic scaphotrapeziotrapezoid arthrodesis
Material & Methods: Surgical Technique: A two-portal (MCU and MCR) technique was utilized for the denudation of the articular surfaces of the STT joint. A separate incision was made to harvest cancellous autograft bone plugs from the distal radius using a trephine. The bone plugs were introduced into the articular void using the same trephine. Fixation was performed with two headless cannulated compression screws. Postoperative immobilization lasted for 6 weeks.
Results: Ten patients (3 male/7 female) with isolated STT osteoarthritis were included, operated on by two level 4 surgeons. The mean age was 65,5 years (range 58-75). None of the patients were smokers. A routine CT scan at 3 months confirmed bony union in 100% of cases. The final assessment was performed after a mean follow-up of 15,1 months (range 7-36). The preoperative mean SL angle was 57,5°, the CL angle was 18,9°, and the RL angle was 17.1°. Postoperatively, the mean SL angle was 52,3°, the CL angle was 16,5°, and the RL angle was 16,2°. No statistically significant differences were observed. Outcome measurements were compared to preoperative status. The mean total flexion-extension arc decreased by 11%, grip strength increased by 38%, and mean pain (VAS) decreased by 96,7% at follow-up, which was statistically significant. The mean QuickDASH score was 10,5. Occupational activities were resumed after an average of 3,6 months. All patients indicated they would opt for the surgery again, with a mean satisfaction score of 9,5 out of 10. No complications were noted, and no symptomatic secondary arthritis or radioscaphoid impingement was reported until the latest follow-up.
The less invasive nature of arthroscopy allows for better preservation of vascularity compared to open surgery. This is the first study to support the superiority of arthroscopy, demonstrating 100% radiologically confirmed bony union at 3 months. Influencing factors may include the level of expertise of the arthroscopist, systematic use of cancellous bone autograft from the distal radius with an additional metaphyseal core decompression effect, access via only one direct portal to the STT joint, and the fixation technique used. Alternative techniques have documented complications not encountered with arthroscopic STT fusion, such as increased non-dissociative instability with resection arthroplasty, implant dislocation with implant arthroplasty, longer recovery periods, and greater grip strength loss with trapeziectomy
Conclusions: Arthroscopic scaphotrapeziotrapezoid arthrodesis appears to be a valuable option for treating STT osteoarthritis. Further studies are needed to compare this technique with alternative options, such as resection arthroplasty or trapeziectomy, in both open and arthroscopic manners.

A-0307 BENEATH THE SURFACE: UNVEILING RISK FACTORS FOR FISHTAIL DEFORMITY FOLLOWING SUPRACONDYLAR HUMERUS FRACTURES

Andrew Kim, Scott J Mahon, Sulagna Sarkar, Brendon C Mitchell, Sayaka Mori, Christine M Goodbody, Apurva S Shah
Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

Introduction: 'Fishtail' deformity, or avascular necrosis of the trochlea, is a rare complication following supracondylar humerus fractures. Long-term follow-up has shown that the development of fishtail deformity, while uncommon, can lead to significant pain, functional deficits, and early-onset osteoarthritis. The incidence and risk factors for developing fishtail deformity have not been previously described.
Aim: This investigation sought to estimate the incidence and identify patient- or treatment-specific risk factors for the development of fishtail deformity following operatively managed supracondylar humerus fractures.
Material & Methods: A retrospective case-control study of children with operatively managed supracondylar humerus fractures from 2013-2022 at a tertiary-care pediatric hospital was performed. Demographic, operative, and clinical variables were extracted from electronic medical records. Preoperative and initial postoperative anteroposterior and

lateral elbow radiographs were used to assess fracture displacement and assign Gartland classification. Each 'fishtail' case was matched to four randomly selected controls that met inclusion-exclusion criteria. Only control patients with a minimum follow-up duration at our institution of 64.9 months were included, as 95% of the fishtail deformities in this series presented during that time frame. Wilcoxon Rank Sum tests and Fisher tests were used to identify risk factors.
Results: 80 patients (fishtail: 16, control: 64) with a mean age of 6.4 ± 2.5 years at injury met inclusion criteria. 40 (50%) subjects were female. The overall incidence of fishtail deformity following operative treatment at our institution was 0.7% (16/2400). The odds of fishtail deformity varied significantly with fracture displacement (Gartland classification) (p=0.011). Specifically, patients with Gartland type III fractures had 4.1-times greater odds of developing fishtail deformity than those with type II fractures (p=0.018). Each additional year of age at injury increased the odds of fishtail deformity 1.4 times (p=0.005). Challenges in fracture reduction and/or fixation also appeared to increase the risk for avascular necrosis, because for each additional milligray unit of intraoperative radiation, the odds of fishtail deformity increased by 1.2 times (p=0.021)
Conclusions: Fracture displacement, age at injury, and intraoperative radiation exposure are all identifiable risk factors for the development of fishtail deformity following surgical treatment of supracondylar humerus fractures. Though a rare complication, the development of a fishtail deformity can significantly impact a patient's quality of life. Better characterizing potential risk factors may allow us to recognize high-risk groups of patients. Further research may also identify opportunities to modify operative technique and reduce the incidence of this uncommon but consequential complication.

A-0308 COMPUTED TOMOGRAPHY BASED THREE-DIMENSIONAL ANALYSIS OF THE SIDE-TO-SIDE DIFFERENCES OF METACARPALS

Nikita Sutter, Lea Estermann, Christina Wanivenhaus, Andreas Schweizer
Balgrist University Hospital, Zurich, Switzerland

Introduction: Metacarpal fractures frequently result in rotational or angulation deformities, as well as shortening, which can lead to functional impairment and may require surgical correction, particularly in cases of severe malunion. CT-assisted preoperative planning is becoming a standard practice for assessing bone alignment using the contra-lateral metacarpal bone as reference for proper alignment. However, limited data exists on the physiological asymmetries between the left and right metacarpals. A deeper understanding is essential as it could affect the accuracy of using the contralateral side as a reference, potentially influencing surgical outcomes.
Aim: This study aims to assess bilateral asymmetries of metacarpal bones using 3D-reconstructed CT scans. We hypothesized that substantial anatomical asymmetries exist between left and right metacarpal bones, which may impact preoperative planning in surgical settings.
Material & Methods: Three-dimensional bone models of all metacarpals of 20 healthy participants (40 hands) were created from computed tomography data obtained between November 2016 and April 2019. 3D-reconstruction was performed using CASPA software. Twelve measurements were performed by two independent raters to account for inter-observer variability. Each left-hand metacarpal bone was mirrored and aligned to its corresponding right-hand counterpart. The alignment was performed separately at the base and of the metacarpal using an Iterative Closest Point (ICP) surface registration algorithm to ensure precise fit. Differences were calculated along the x-, y- and z-axis relative to a coordinate system based on the right-hand metacarpal. Geometric measurements were analyzed in two domains: measurement agreement and measurement reliability. Agreement was assessed via standard error of measurement

(SEm), while reliability was evaluated using intra-class correlation coefficients (ICC) and 95% confidence intervals based on a two-way random effects model assessing the absolute agreement.
Results: Our findings indicated minor asymmetries between left- and right-hand metacarpal bones. Length differences ranged from 0.02 mm to 0.62 mm across all metacarpals, with statistically significant differences observed in the 1st, 3rd and 4th metacarpals. Rotational discrepancies were most pronounced along the axial axis with a mean supination of 0.07° to 4.43° for the 1st to 5th metacarpals. Notably, the left 2nd metacarpal showed a supination of 3.5° ($p=0.002$), and the 3rd left metacarpal, 4.4° ($p<0.001$) in comparison to the right counterpart. Variations in angulation ranged from -1.67° volar to 0.79° dorsal angulation, and -2.01° radial to 1.27° ulnar deviation. Among these, only the radial deviation of -1.67° and volar angulation of -2° of the 5th metacarpal showed statistical significance ($p<0.05$). Inter-reader reliability for all assessed parameters and joints was very high with SEm values between 0.016 and 0.448 and ICC values from 0.958 to 1.000.
Conclusions: These findings suggest that physiological bilateral asymmetries in the metacarpal bones exist, though they are minor and likely insignificant in most cases for clinical practice. The most notable asymmetry was a supination of the 2nd and 3rd left-hand metacarpal compared to the right side. Given these findings, while the contralateral metacarpal can generally be used as a good reference in surgical alignment, surgeons should be aware of these slight variations.

A-0310 (DON'T) BRACE YOURSELF: POST-CASTING IMMOBILIZATION DELAYS RETURN TO FULL RANGE OF MOTION IN PEDIATRIC OLECRANON FRACTURES

Casey Kuka, Scott J Mahon, Brendon C Mitchell, Sayaka Mori, Miguel Fiandeiro, J Todd Lawrence, Apurva S Shah
Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

Introduction: Cast immobilization is the standard treatment for nondisplaced and stable minimally displaced olecranon fractures in skeletally immature patients. Prolonged immobilization with post-cast splinting or bracing has been noted to delay recovery of normal elbow range of motion (ROM) in other pediatric elbow fractures, but this has not been investigated for olecranon fractures.
Aim: This study aimed to evaluate the effects of splinting or bracing post-cast removal on elbow ROM recovery following cast treatment of nondisplaced olecranon fractures in skeletally immature patients.
Material & Methods: This was a single-center, retrospective cohort study of pediatric (≤18 years old) patients presenting with acute olecranon fractures managed with cast immobilization. Patients were grouped by whether they were managed with post-cast splinting/bracing (S) or not (NS). Duration of rigid cast immobilization, time from injury to best range of motion, time from injury to radiographic union (defined as three out of four cortices with bridging callus on radiographs), and duration of total follow-up in both groups were recorded. Patients without documented recovery of full elbow motion on the injured side were excluded. Statistical analyses were performed in IBM SPSS Statistics v29.
Results: 88 patients (39 [44%] female) with a mean age of 6.3 ± 3.6 years met inclusion criteria. There were 27 patients in the S group and 61 in the NS group. No patients had documented orthopaedic comorbidities. There was no significant difference in mean initial rigid cast immobilization duration between the S and NS groups (3.9 ± 1.2 vs 4.3 ± 1.2 weeks, $p=0.12$) or in duration of follow-up (14.0 ± 14.0 weeks in S group vs 11.7 ± 13.6 weeks in NS group, $p=0.08$). Patients managed with a splint or brace after cast removal experienced significantly longer times to full elbow ROM compared to patients who discontinued immobilization following cast removal (13.3 vs 10.8 weeks, $p=0.03$). Only one patient in the S group experienced delayed union, but this case did not require surgery. No other complications or refractures were identified in either group
Conclusions: Post-cast splinting or bracing prolongs time to full recovery of elbow ROM after cast immobilization in

patients with acute nondisplaced or stable minimally displaced olecranon fractures. Physicians should consider foregoing post-cast splinting or bracing after cast removal for olecranon fractures with evidence of healing as demonstrated by resolution of pain and development of bridging callus on radiographs. Unrestricted motion could improve short-term function and may permit an earlier safe return to sports and playground activities.

A-0311 BIFID MEDIAN NERVE IN CARPAL TUNNEL SYNDROME PATIENTS

Aikaterini Sourmenidi, Alexandros Koskiniotis, Eleftheria P Adaktylidou, Antonios Koutalos, Dimitrios Lamprou, Sokratis Varitimidis
University Hospital of Larissa, Orthopaedic Department, University of Thessaly, Larissa, Greece

Introduction: Carpal tunnel syndrome occurs in a large percentage of the population. Surgical treatment is the definitive solution for many of the patients. There is a large number of variations in the anatomy of the carpal tunnel and its contents, with the bifid median nerve being one of those that occurs with a relatively high frequency that varies in the literature from 1 to 21%. Many surgeons do not use any imaging examination before the operation to identify anatomical variations or other pathologies.
We conducted an observational study on the frequency of the bifid median nerve in patients with carpal tunnel syndrome using ultrasound and its identification intraoperatively by the therapist or not.
Aim: We conducted this study to identify the frequency of the bifid median nerve in patients with carpal tunnel syndrome and its identification intraoperatively by the surgeons.
Material & Methods: Ultrasound of the wrist at the level of the entrance and exit of the carpal tunnel was performed with the Esaote MyLabX6 ultrasound machine in 20 patients before carpal tunnel surgery. Subsequently, in those in whom the anatomical variant was identified by ultrasound, it was studied whether the surgeon identified the second branch of the nerve without being informed of the result of the ultrasound examination.
Results: Of the 20 patients, the variant of the bifid median nerve was identified in 2. In both cases, the surgeon did not recognize the presence of the second branch intraoperatively
Conclusions: Bifid median nerve is not that rare and it is difficultly recognized by the surgeon if there is no imaging before surgery. Ultrasound is a cheap examination, available in every hospital that can give information about the anatomy of carpal tunnel and its pathology.

A-0312 COMPLICATED FRACTURES OF THE MIDDLE PHALANX: A SURGICAL APPROACH COMBINING CLOSED REDUCTION, INTERNAL FIXATION AND LIGAMENTOTAXIS

Efrat Daglan[1], Avi Adam Cohen[2], Alex Mertic[1], Jean Yang[1], Woo A Kim[1], Patrick Goon[1]
[1]East and north Hertfordshire NHS trust, Lister Hospital, Stevenage, UK; [2]Shamir Medical Center (Assaf Harofeh) Be'er Ya'akov, Israel

Introduction: Pilon fractures of the base of the middle phalange are often challenging to reduce and present considerable difficulty in restoring the joint surface with a close approach. we presenter some of our recent experience using a combination of surgical techniques to reduce and fixate the fracture with good clinical result and range of motion.
Aim: Material & Methods: 6 patients with complex pilon fractures at the base of the middle phalange and under local or regional block utilized 3 techniques to achieve reduction.

1. Reduction: via short dorsal access incision distal to the fracture, reaching the cortex of the middle phalanx, a hole is drilled (1.6 to 2.0mm) to the intramedullary canal and using the blunt edge of a 1.2mm KW through the hole the fracture is reduced and joint surface restored.
2. Fixation of the restored base of phalanges via 2 parallel 0.9mm KW dorsal to volar and above them 2 0.9mm KW radial to ulnar to buttres the fracture and to prevent compression towards the joint.
3. To maintain the joint space, we then installed a ligamentotaxis frame or a Suzuki frame.
The patient was instructed to start mobilizing immediately form post-operative day 1. The frame was removed 3 weeks after the initial operation and the KW removed 3 weeks later under local anesthesia at theater.
Results: of the 6 patients included no major complications were recorded, all fractures had good radiologic healing up to and including 3 months follow up. Range of motion was satisfactory with range of MCP 80-90deg, PIP 80-90deg and DIP 20-30 deg. Notably a trend of ongoing improvement was seen in all 6 patients. As for minor complications 2 patients developed mild earl surgical site infections that resolved with antibiotic treatment.
Conclusions: we believe the above technique employed and the early mobilization it allowed gave forth the excellent results observed.

A-0313 CLOSED REDUCTION AND INDIRECT INTERNAL FIXATION IN EIGHT ISOLATED FRACTURES OF THE HOOK OF HAMATE AS A SUFFICIENT TREATMENT IN ACUTE AND CHRONIC TREATMENT FOR ATHLETIC PATIENTS

Marco D. Rohner, Titus Thut, Sebastian Günkel
City Hospitals Zürich, Switzerland

Introduction: Fragment excision is the current standard therapy in clinically disturbing isolated fractures of the hook of hamate. We hypothesize that internal fixation can show bony healing and satisfied patients. This is especially important in those who have a high athletic demand by gripping on a bat or handle, like baseball players, ice hockey players or bike riders avoiding secondary complications like median and ulnar nerve neuropathologies.
Aim: To challenge the current standard treatment of excision of the hook of hamate in symtomatic patients
Material & Methods: Retrospective case series including 8 patients with an average age of 34 years who were treated with closed reduction and internal fixation of an isolated hook of hamate fracture. Radiographic and clinical results with a minimum follow-up of 3 months are presented.
Results: The average time to healing was 13 weeks. After 3 months there was an average of 88 %bony healing documented. Only one patient showed a healing below 70% after 3 months. The same patient showed a 100% healing at the 1-year follow-up. 8 of 8 acute and delayed hook of hamate fractures healed in this case series. Fully bony healing was proven in all cases by CT scan. All patients returned to their competitive sports and work without any limitations.
Conclusions: The presented case series is small but the largest so far to challenge the current gold standard treatment of fragment excision in isolated hook of hamate fractures in symptomatic patients and athletes. In the presented small cohort of patients who play ice hockey, baseball or ride motocross bikes and non-motorized bikes, or competitively use their hands otherwise in regular sport activities, very satisfactory results could be achieved without the standard treatment of excision of the hook of hamate. Furthermore, the authors believe that secondary complications like neuropathies of the median and ulnar nerve in these athletes could potentially be avoided by restoring a stout bony anatomy to protect the neurovascular structures. At long term a stable carpal tunnel and Loge de Guyon, which are constantly at risk in these patients, might be beneficial in this special cohort of patients.

A-0315 HUMAN EPINEURAL PATCH (HEP) PROTECTION FOLLOWING COMPLEX SCIATIC NERVE INJURY

Maria Siemionow, Katarzyna Kozłowska, Sonia Brodowska, Dominika Kuc, Lucile Chambily, Gabrielle Filipek, Weronika Radecka

Department of Orthopaedics, University of Illinois at Chicago, Chicago, IL, USA

Introduction: Effective protection is essential for supporting nerve regeneration under challenging wound conditions. In this study, we introduce the application of a human epineural patch (hEP) as a novel nerve protector for enhancement of nerve regeneration following complex injury and compare its effectiveness with commercially available human amniotic membrane (hAM).

Material & Methods: Following sciatic nerve crush injury, transection, and end-to-end repair (CTR), thirty-six athymic nude rats (Crl:NIH-Foxn1rnu) were randomly assigned to six experimental groups (n=6 each) and divided into the follow-up periods of 6-weeks (Groups 1, 2, and 3) and 12-weeks (Groups 4, 5, and 6). The groups were defined as follows: Group 1 and Group 4 (control, no-protection); Group 2 and Group 5 (hEP application at the nerve repair site); and Group 3 and Group 6 (hAM application at the nerve repair site). Functional and histological assessments were conducted at 6 and 12 weeks post-injury. Functional recovery was evaluated through the Toe-Spread and Pinprick tests, and muscle denervation atrophy was assessed using the Gastrocnemius Muscle Index (GMI). Histological analyses included measurements of myelin thickness, axonal density, fiber diameter, and the percentage of the myelinated fibers. Immunofluorescence staining was used to assess the expression of neurotrophic (NGF, Laminin B, S-100), angiogenic (VEGF, vWF), and immunogenic (HLA-I, HLA-DR) markers.

Results: The hEP group exhibited the best motor (3.167 ± 0.167) and sensory (3.500 ± 0.212) recovery as well as GMI values (0.955 ± 0.014), compared to the no-protection group ($p < 0.05$). Myelin thickness (3.480 ± 0.019 µm, $p < 0.0001$), fiber diameter (10.788 ± 0.197 µm, $p < 0.05$), and the percentage of myelinated fibers ($89.841\% \pm 0.453\%$, $p < 0.01$) values were significantly higher in the hEP group. Application of hEP was associated with significantly increased expression of Laminin B (2.083 ± 0.083), NGF (1.750 ± 0.250), VEGF (2.667 ± 0.333), and vWF (2.333 ± 0.667). Additionally, the hEP group showed a reduction in the expression of immunogenic markers of HLA-DR (1.333 ± 0.441) and HLA-I (0.583 ± 0.300) when compared to both the no-protection (2.500 ± 0.289; 1.417 ± 0.300, respectively) and the hAM group (2.167 ± 0.167; 1.750 ± 0.520, respectively). Statistical difference was defined as $p < 0.05$.

Conclusions: This study confirmed that applying the hEP patch at the sciatic nerve repair site following CTR injury significantly enhanced nerve regeneration compared to the hAM patch. Moreover, the hEP patch improved functional recovery, which correlated with reduced inflammation and enhanced sciatic nerve regeneration after complex trauma. Therefore, this study introduces hEP as a novel alternative nerve protector following traumatic nerve injuries.

A-0316 QUANTIFICATION OF ARTICULAR SURFACE INVOLVEMENT DURING INTRAMEDULLARY FIXATION OF THE PHALANGES

Julie Mekhail[1], Peter Falgiano[2], John Heifner[3], Jorge Orbay[4], Deana Mercer[1]

[1]University of New Mexico Department of Orthopedics; [2]Miami Orthopedic Research Foundation; [3]Larkin Hospital Department of Orthopedic Surgery; [4]Miami Bone and Joint Institute

Introduction: Phalangeal fractures are the second most common upper extremity fracture in the United States.1 Numerous studies have reported the biomechanical efficacy of intramedullary (IM) hand nail fixation and the recent literature indicates increased utilization of IM hand nails.2, 3

Aim: This study seeks to quantify the percentage of cartilage involvement created by various intramedullary fixations

phalangeal fractures with 3.0 mm and 3.5 mm IM threaded hand nails.
Material & Methods: Four different techniques for screw placement were utilized; retrograde across an unflexed distal interphalangeal joint (DIPJ), retrograde across a flexed DIPJ into the middle phalanx, retrograde through a flexed proximal interphalangeal joint (PIPJ) into the proximal phalanx and antegrade through the metacarpal phalangeal joint (MCPJ) into the proximal phalanx. Clinical photographs and fluoroscopy images were used to quantify the amount of articular cartilage damage.
Results: The articular involvement using intramedullary hand nails for phalangeal fixation was less than 10% of the articular surface regardless of screw placement technique and screw size (range 3.56% - 9.73%). In all instances, the involved area involvement was greater with the 3.5 mm than the 3.0 mm screws.
Conclusions: Our results demonstrate articular surface involvement that aligns with that previously reported in the literature. We show multiple techniques not known to be previously reported including the fixation technique through the DIPJ. Phalanx fracture fixation with intramedullary hand nails may be beneficial as it may provide a stable construct to allow immediate motion with no soft tissue tethering and potentially acceptable joint cartilage involvement.

A-0317 WARTIME VERSUS PEACETIME HAND TRAUMA: LESSONS FROM THE UKRAINIAN CONFLICT

Stepan Kuchabskyi[1], Sarah Tucker[2]
[1]CO CF SUPERHUMANS, Lviv, Ukraine; [2]John Radcliffe Hospital, Oxford University Hospitals NHS Trust, UK

Overview: The war in Ukraine has introduced unprecedented challenges in reconstructive hand surgery, highlighting stark contrasts in injury patterns, complexity, and the demands placed on surgical and rehabilitative care compared to peacetime trauma. This presentation examines these differences, sharing practical insights and lessons learned in adapting to the demands of wartime injuries.
Key Differences: Wartime hand injuries, often caused by high-energy mechanisms such as blasts, shrapnel, and crushing forces, present complex challenges that seldom arise in peacetime. These injuries commonly involve severe tissue destruction, extensive vascular damage, and nerve injuries, requiring advanced reconstructive techniques, staged procedures, and prolonged rehabilitation. In contrast, peacetime injuries tend to be lower in energy, with simpler mechanisms like falls or work-related accidents that typically allow for quicker, less resource-intensive interventions. A selection of cases from Lviv in Ukraine is compared to cases from Oxford as a similar size population and catchment area. Differences in injury extent and the approaches need are highlighted.
Implications for Practice: The unique demands of wartime injuries underscore the need for specialized surgical skills, including proficiency in microsurgery and complex tissue reconstruction. Effective management in these cases also requires close coordination with multidisciplinary teams for both acute and long-term rehabilitation, an approach less emphasized in traditional trauma care. The Ukrainian experience reinforces the importance of preparedness for high-complexity trauma and adaptability in clinical protocols to manage the sudden influx of severe cases.
Conclusion: As conflict-related trauma becomes more prevalent globally, the Ukrainian experience offers invaluable lessons in adapting reconstructive strategies for high-energy, complex injuries. Preparing surgical teams to address these distinct challenges can enhance outcomes in conflict settings and ensure continuity of care from initial intervention through rehabilitation. These insights are critical not only for active conflict zones but also for any setting anticipating a shift in trauma patterns due to geopolitical instability.

A-0319 HAND PREHENSION IN TOTAL ROOT AVULSION TRAUMATIC BRACHIAL PLEXUS INJURIES USING CONTRALATERAL C7 TRANSFER: SYSTEMATIC REVIEW AND META ANALYSIS

Usama Farghaly Omar[1], Mahmoud Salama[2], Ebeed Yasin[2], Milan Lepic[3], Lukas Rasulic[3]

[1]Department of Orthopaedic Surgery, Hand and Reconstructive Microsurgery Service, Khoo Teck Puat Hospital, Singapore; [2]Department of Orthpaedic Surgery, Aswan University, Aswan, Egypt; [3]Clinic for Neurosurgery, University Clinical center of Serbia, Belgrade, Serbia

Introduction: Contralateral C7 nerve transfer was described by Gu et al, in 1991. Since that time, it has become a new and significant addition to the nerve transfer donors especially for the total avulsion cases but at the same time, it is still controversial for nerve transfer due to the morbidity risk and the heterogenicity of the results.

Aim: address the different techniques of using the contralateral cross-neck C7 root as a donor nerve to restore the hand prehension and its reliability to achieve reasonable outcomes Also, to show differences between the motor recovery outcomes in hand function according to each technique used. To outline the techniques that would achieve the most function that the patient could have.

Material & Methods: Relevant studies in English literature were identified from database inceptions until January 2024 for which an electronic-based search was conducted on MEDLINE (PubMed) using the following keywords with their synonyms: ((((("contralateral c7"[All Fields] OR "contralateral c-7"[All Fields]) OR "cross neck c7"[All Fields]) OR "c7 nerve root"[All Fields]) OR "seventh cervical nerve root"[All Fields]) AND "total brachial plexus"[All Fields] AND "complete palsy"[All Fields] OR "complete lesion"[All Fields]. Besides, the reference lists from previous articles were searched manually to check for eligible studies.

Results: We analyzed data from 22 studies published between 1998 and 2023 (12-33). Motor function recovery in patients who underwent cC7 nerve transfer. Data on motor function recovery was available from 22 studies with 689 patients. Meta-analysis investigating motor power recovery found that 251 cases showed M3 or more muscle function after surgery. The overall recovery rate was 40% (95% CI: 30% to 50%). Studies reporting motor recovery showed moderate heterogeneity (I2:78%). Eggers' test of the intercept did not indicate the presence of funnel plot asymmetry (intercept: -1.223, 95%CI: -2.96 to -0.52, p=0.184).

Hand sensory recovery data was available for 348 patients reported in 13 studies published between 1998 and 2023. Sensory recovery was observed in 348 cases, and a meta-analysis of included studies showed that the overall recovery rate was 68% (95CI: 56% to 79%). Data reporting sensory recovery showed moderate heterogeneity (I2:75%)

Conclusions: According to our systematic review, we found statistically significant results supporting the following technical recommendations to improve the outcomes of hand recovery: using total cC7 transfer and cutting as distally as possible. The preferred recipient is the mobilized lower trunk. This would allow direct coaptation between both donor and recipient nerves.

A-0320 SAFETY AND EFFICACY OF A MODIFIED WALANT TECHNIQUE USING UNDILUTED ADRENALINE DURING OPEN SURGICAL CARPAL TUNNEL RELEASE: A PROSPECTIVE REPORT OF 308 PROCEDURES

Mohamed Mostafa Kotb[1,2], Usama Farghaly Omar[2,3], Ahmed A. Khalifa[4]

[1]Upper Limb and Reconstructive Microsurgery Unit, Orthopedic Department, Assiut University Hospital, Asyût, Egypt; [2]Orthopaedic Surgery Department; [2]Al-Hekma Specialized Hospital, Asyût, Egypt; [3]Department of Orthopaedic Surgery, Hand and Reconstructive Microsurgery Service, Khoo Teck Puat Hospital, Singapore; [4]Orthopedic Department, Qena Faculty of Medicine and University Hospital, South Valley University, Kilo; [6]Qena-Safaga Highway, Qena, Egypt

Introduction: Median nerve compression neuropathy at the wrist level, commonly known as carpal tunnel syndrome (CTS), is a common problem affecting the patient's activities of daily living (ADL). In an attempt to decrease the waiting lists and save costs, Dr. Lalonde, introduced the wide-awake local anesthesia no tourniquet (WALANT), which is a technique in which is a local anesthetic accompanied by vasoconstrictive agents are used, which eliminates the need for sedation or tourniquet

Aim: The current study aimed to report on the safety and efficacy of utilizing a modified WALANT (mWALANT) technique during open surgical carpal tunnel release (CTR), where we used undiluted epinephrine compared to the originally described WALANT technique.

Material & Methods: From January 2015 till the end of June 2021, 200 patients (175 (87.5%) were females) who presented with carpal tunnel syndrome, either bilateral (108 (54%) patients) or unilateral (92 (46%)) were included, formulating a total of 308 procedures. Open surgical CTR was performed as a daycare procedure by the same surgeon. The mWALANT injectable mixture was prepared by mixing 8 CC of 2% lidocaine HCl + 1 CC of 0.25 mg/1 ml epinephrine without dilution (2.5 times the concentration used in the original WALANT technique). The injection was performed before draping.

Results: The patients' average age at surgery was 42.88 ± 13.03 years old; they were followed up for an average of 31 ± 17.17 months. The average operative time was 9.5 ± 1.87 min. None (0.0%) of the patients needed top-up of local anesthesia or shift into general anesthesia, and no (0.0%) patients needed postoperative hospital stay. The average VAS during the surgical procedure was 2.5 ± 2.1, mainly reported during infiltration of the local anesthesia; no patients reported discomfort during the surgical procedure itself. 180 (90%) patients reported a full return to their usual preoperative ADL after an average of 4.7 ± 1.2 weeks. No (0.0%) postoperative fingers ischemic or temperature changes. Two (1%) patients experienced an adrenaline rush in the form of tachycardia that needed sedation and close monitoring by the anesthesiologist; they were discharged on the same day. One (0.5%) patient (who had uncontrolled diabetes mellitus) showed a superficial wound infection which resolved after conservative management.

Conclusions: Using undiluted epinephrine during the mWALANT technique is safe and effective. There is no need to wait until the drugs fully function, and no epinephrine-related complications were encountered apart from occasional adrenaline rush symptoms.

A-0322 CORRECTION OSTEOTOMY FOR VOLARLY DISPLACED FRACTURE MALUNIONS OF THE DISTAL RADIUS USING 3D CT-BASED SURGICAL NAVIGATION SYSTEM

Souichi Ohta, Yukitoshi Kaizawa, Chisato Funamoto

Kansai Electric Power Hospital, Osaka, Japan

Introduction: The surgical navigation system displays the position of surgical tools relative to the bone so as to guide the surgeons to perform operation precisely. However, it is hard to present the position of the small distal fracture fragment.

We developed precise osteotomy procedure using a navigation system with insertion of a pre-shaped artificial bone into the osteotomy gap to attain an ideal position of the reduced distal fragment

Aim: We report small experiences to perform radius osteotomy using 3D CT-based surgical navigation with CT-fluoro matching registration in the treatment of volarly displaced fracture malunions

Material & Methods: Three patients with volarly displaced fracture malunions of the distal radius were treated. The mean age at the surgery was 40 years old. All patients were male. Two were left side and the another was right side. One was extraarticular fracture malunion and the other two were intraarticular fracture malunions. The procedures included two cases with an open wedge osteotomy and one case with diaphyseal extension combined with an open wedge osteotomy at the articular surface.

Before the operation, we first created a virtual object of the lesioned and contralateral intact radius bones from CT scan data using simulation software (iPLAN cranial; BRAINLAB, Germany). Then, we created a mirror image of the intact radius bone object and moved it so as to perfectly fit its proximal part with that of the lesioned side. After an osteotomy plane was designed on the basis of the original fracture line and perpendicular to the radial diaphysis in the coronal plane, the detached distal part object of the lesioned radius was moved to match with that of the mirror image of the intact radius bone. Then, a triangular prism-shaped artificial bone for insertion into the osteotomy gap was designed.

At the beginning of the surgical procedure, two 2.4 mm diameter threaded rods were inserted at the center of the radial diaphysis and three reference balls were attached to the stem. Next, an image intensifier-based CT image (ARCADIS Orbic; Siemens, Germany) of the distal radius was taken. Then, the newly acquired 3D CT images were combined with the pre-planned lesioned radius object on the navigation system display (KICK; BRAINLAB, Germany). Trans-FCR approach was used. After confirmation of the pre-planned osteotomy plane with a navigation probe, two 1.5-mm diameter wires were inserted at the pre-planned osteotomy lines. Then, osteotomy was performed with a bone saw along these two wires. After the insertion of the pre-shaped artificial bone into the osteotomy gap, fixation was performed with an anatomical distal radius locking plate

Results: The mean follow-up was 2years and 1month. At the final follow-up, wrist extension, wrist flexion, pronation, and supination improved 28.3°, 21.7°, 20°, 48.3°, respectively. Grip strength improved 36% of the unaffected side. qDASH improved 26.5. Volar tilt improved from 21.3 to 9.3 degrees. Ulnar variance improved from plus 5.6 to plus 1.3mm

Conclusions: 3D-CT based surgical navigation system with CT-fluoro matching registration has a potential to become useful assist tool to attain complicated osteotomy with a limited operative field.

A-0324 MODIFIED CONTRALATERAL C7 TRANSFER TO RESTORE ULNAR NERVE FUNCTION WITHOUT SACRIFICING MEDIAN NERVE RECOVERY: AN EXPERIMENTAL STUDY

Jing Rui, Kaiming Gao,Jingbo Liu, Jie Lao
Huashan Hospital, Fudan University, Shanghai, China

Introduction: Contralateral C7 (cC7) transfer is a technique used in patients with total brachial plexus avulsion. An ulnar nerve graft (UNG) is usually used, as intrinsic function is not expected to be restored due to length of reinnervation required

Aim: In this animal study, we attempted to improve intrinsic function recovery by preserving the deep branch of the ulnar nerve (dbUN) and reanimating it with the anterior interosseous nerve (AIN) after cC7 transfer

Material & Methods: Fifty-four rats were divided into the following three groups: Group A, traditional cC7 transfer to the median nerve with a UNG; Group B, cC7 transfer preserving and repairing the dbUN with the terminal branch of the AIN; Group C, same as Group B; however, the dbUN was coapted after 1 month with the AIN. At 3, 6 and 9 months

postoperatively, six rats in each group were evaluated, and the flexor digitorum profundus and the second interosseous muscles were selected as representative muscles for median nerve (MN) and dbUN, respectively
Results: At 3, 6 and 9 months postoperatively, the results of electrodiagnostic and histomorphometric examinations of the interosseous muscle were significantly better in Groups B and C, without affecting AIN recovery
Conclusions:The modified cC7 transfer technique can potentially improve intrinsic function recovery without affecting median nerve recovery.

A-0327 A COMPARABLE RETROSPECTIVE RESEARCH OF ARTIFICIAL DERMAL REGENERATION AND FLAP RECONSTRUCTION IN COVERING OF SKIN AND SOFT TISSUE DEFECT OF THE DISTAL PHALANGEAL FINGERS WITH BONY OR TENDON EXPOSURE

Xin Zhao
Department of Hand-microsurgery Tianjin Hospital, China

Introduction: Flap reconstruction is the traditional surgical treatment of skin and soft tissue defects with bone or tendon exposure of the distal phalangeal finger, given its unique sense and appearance. However, it brings the problems of flap necrosis, sensation loss, cicatrices contracture, the sacrifice of the donor site, and aesthetics. The cost of surgery and post-operational treatment is also considerable. The artificial dermal template regeneration technique has emerged as an alternative treatment in recent years. This retrospective study aimed to better treat skin and soft tissue defects in the fingers by evaluating and comparing the costs and outcomes of the artificial dermal template regeneration and flap reconstruction for these cases.
Aim: To compare the effect of artificial dermal regeneration and flap reconstruction in covering skin and soft tissue defects of the distal phalangeal fingers with bony or tendon exposure.
Material & Methods: From January 2022 to May 2024, 22 patients (26 fingers) with skin and soft tissue defects with bone exposure in the distal phalangeal finger were selected to be treated with artificial dermal template coverage (Group A), and 24 patients (26 fingers) with flap reconstruction (Group B) respectively. The cases combined with tendon injury and fracture were excluded. The operation time, survival rate, sensory recovery, scar formation, pain scale, overall appearance, TAM scores, and treatment cost were evaluated and compared with the average following-up of 13 months (range, 11-19 months) in group A and 15 months (range, 12-24 months) in group B.
Results: The average operation time is 33.7 minutes /finger in group A and 88.4 minutes /finger in group B. All the artificial dermal templates survived in group A except one necrosis due to the defection, the wound of which was healed by changing dress. Three flaps were found necrosis in group B. We found an average static 2-point discrimination of 7 mm (range 4 to 14 mm) in group A, while 6.3 mm (range 3 to 15 mm) in group B. No outside defect site scar formation was found in group A, which is all in group B. Pain scales of early-stage postoperative in group A are lower than in group B. 86.4% of patients in group A (compared with only 58% of patients in group B) were satisfied with the appearance of their involved hand. The average TAM score is 14.7 in group A and 8.9 in group B at the final follow-up. The costs are 1281.2 and 1689.4, respectively, in groups A and B.
Conclusions: Artificial dermal template provides a better method of repairing skin and soft tissue defects in distal phalangeal fingers. Compared with flap, it has apparent advantages in survival rate, function, aesthetics, and cost-effectiveness. It does not require any skin and soft tissue loss at the donor site, thus reducing patients' pain and scars. In cases of skin and soft tissue defects with bone exposure in distal phalangeal fingers, artificial dermal template covering is a prior treatment.

A-0328 OBLIQUE X-RAY VIEWS IMPROVE THE DETECTION OF THE ULNAR CORNER FRAGMENT IN DISTAL RADIUS FRACTURES

Bong Cheol Kwon, Jae Young Yoon, Kang Uk Lee
Hallym University Sacred Heart Hospital, Anyang-si, South Korea

Introduction: The lunate facet of the distal radius plays a crucial role in wrist stability, particularly through its volar and dorsal ulnar corners which attach important stabilizers for the radiocarpal and distal radioulnar joints. Failure to adequately fixate the ulnar corner fragment of the lunate facet (UCFL) in distal radius fractures can lead to significant complications, such as loss of reduction, joint instability, and persistent pain

Aim: The purpose of this study was to evaluate the value of oblique views for the detection of UCFL in distal radius fractures by comparing the detection rates of oblique + standard views against standard views alone. We hypothesize that incorporating semi-pronation and semi-supination views will significantly improve the detection accuracy of UCFL, thereby enhancing the diagnostic process and informing better treatment strategies

Material & Methods: We retrospectively collected 70 cases of distal radius fractures, categorized into four types. Three different radiograph sets (standard views, standard + semi-pronation oblique views, and standard + semi-supination oblique views) were evaluated by two independent observers at two sessions. Detection rates were compared using 3D CT reconstructions as the reference standard.

Results: Standard views showed poor detection rates for dorsal UCFL (4% for both observers) and volar UCFL (13% for observer A, 27% for observer B). Semi-pronation oblique views significantly improved dorsal UCFL detection (64% for observer A, 56% for observer B; $p<0.001$). Semi-supination oblique views improved volar UCFL detection (53% for both observers, $p=0.002$ for observer A). Inter- and intra-observer reliability were high (ICC=0.73 and 0.84, respectively)

Conclusions: Adding oblique views to standard wrist X-rays significantly increases UCFL detection rates in distal radius fractures. Thus, incorporating oblique views into routine wrist X-rays is recommended for the primary assessment of distal radius fractures.

A-0329 OFF-LABEL USE OF TRAPEZIOMETACARPAL PROSTHESIS: ANALYSIS OF OUTCOMES IN UNCOMMON INDICATIONS

Montse del Valle, Clàudia Roquer, Sonia Suau
Fundació Hospital de l'Esperit Sant, Santa Coloma de Gramenet, Barcelona, Spain

Introduction: The implantation of trapeziometacarpal (TMC) prostheses, specifically the Maïa type, is primarily indicated in patients with advanced osteoarthritis of the TMC joint, characterized by severe pain and functional limitation, especially when conservative treatments have proven ineffective. This type of prosthesis are also an option for patients with significant joint deformity and substantial loss of thumb function, affecting essential movements like pinching or grip strength. The use of these prostheses is not without controversy, as they have specific indications and notable limitations.

Aim: The aim of this study is to analyze off-label indications, outcomes, and potential applications of TMC prostheses in treating less common TMC joint disorders.

Material & Methods: We present four patients treated with the Maïa prosthesis, between 2022 and 2024, all achieving excellent or satisfactory clinical results. Two of these patients received a scaphometacarpal prosthesis; one patient was treated as a rescue following failed arthrodesis, and another following failed osteosynthesis in a Bennett fracture. The age of the patients ranged from 31 to 64 years (average 47.5), all requiring preserved functional mobility and grip

strength. The rehabilitation and de follow-up to queries it is very important to obtain rewarding results.
Results: Among the four patients, three achieved excellent results, and one had regular outcomes, all assessed using the Kapandji test, the QuickDASH scale, and pinch strength measurementsConclusions: In conclusion, Off-label use of TMC prostheses (Maïa) in selected cases, such as failed arthrodesis or osteosynthesis, as well as using the scaphoid instead of the trapezium, is uncommon. Nevertheless, with individualized case selection, this technique may represent a valuable therapeutic alternative to reduce pain, enhance mobility, and preserve strength in complex cases such as those described above.

A-0330 INTEROSSEOUS SCAPHOLUNATE RECONSTRUCTION

Ahmed Abdelkarim, Winkler Wilhelm
Klinikum Rohrbach, Rohrbach, Austria

Introduction: Scapholunate (SL) ligament injuries, if not managed, may lead to carpal instability and subsequent degenerative arthritis. This study presents a case involving SL ligament reconstruction using the Arthrex SL DX SwiveLock technique.
Aim: To evaluate the effectiveness of Arthrex SL DX SwiveLock interosseous repair in restoring wrist stability and function after delayed SL ligament injury.
Material & Methods: Arthrex SL DX SwiveLock interosseous repair
Results: Postoperative assessment indicated restored SL stability with satisfactory range of motion and functional outcomes. The use of the Arthrex system facilitated reliable tendon graft anchoring and joint stabilization
Conclusions: The Arthrex SL DX SwiveLock interosseous repair method appears to provide effective SL ligament reconstruction, enhancing wrist stability and functional recovery in cases with delayed diagnosis. Further studies are warranted to confirm long-term outcomes.

A-0331 IT TAKES A MINIMUM OF 32 CASES TO FLATTEN THE LEARNING CURVE IN THUMB CARPOMETACARPAL IMPLANT ARTHROPLASTY

Daniel B Herren, Kei Mathis, Miriam Marks, Stephan Schindele
Schulthess Klinik, Zurich, Switzerland

Introduction: Thumb carpometacarpal (CMC) implant arthroplasty is becoming increasingly popular for the treatment of thumb CMC osteoarthritis. However, the surgical technique is complex and requires experience on the part of the surgeon.
Aim: The aim of this study was to analyze the learning curve of thumb CMC implant arthroplasty surgery and to determine how many surgeries are required to become proficient.
Material & Methods: We used data from our registry, in which 584 patients with a Touch® (Keri Medical, Switzerland) are prospectively documented. To analyze the learning curve, we included all operations performed by two highly experienced hand surgeons (surgeon A and B). The primary outcome measure was the number of surgeries required to achieve surgical proficiency, defined as exceeding an acceptable failure rate threshold using the cumulative sum (CUSUM) method. In this method, each surgical success or failure results in a cumulative increase or decrease, respectively. Surgical failure was defined by the presence of intraoperative or postoperative complications (e.g., trapezium fracture, implant loosening or dislocation) or a surgical duration of more than 60 minutes. Success was defined as the absence of these factors. A

secondary analysis compared cumulative surgery time with mean surgery time to determine the number of surgeries required to observe a consistent reduction in surgery time.
Results: A total of 274 operations were performed by both surgeons. Surgical proficiency was achieved after 42 cases for surgeon A and 32 cases for surgeon B, with overall failure rates of 4.8% and 4.7%, respectively. The mean surgery time was 39 ± 8 minutes for surgeon A and 43 ± 6 minutes for surgeon B. Using the CUSUM method, surgery times showed a consistent decrease after 38 operations for surgeon A and after 41 operations for surgeon B.
Conclusions: The findings indicate that highly experienced hand surgeons require approximately 32 to 42 procedures to become proficient in thumb CMC implant arthroplasty. Therefore, the learning curve should be considered when starting this procedure.

A-0332 THE USE OF MEDICAL SMART GLASSES AND PLATFORM FOR REMOTE MENTORING OF RESIDENTS IN THE OPERATING ROOM – A PROOF-OF-CONCEPT STUDY

Usama Farghaly Omar, Tong Pei Yein, Koh Eu Wen Aaron, Vaikunthan Rajaratnam
Khoo Teck Puat Hospital, Singapore

Introduction: The integration of advanced technological tools into surgical education offers significant opportunities to enhance the training and proficiency of surgical trainees. Remote mentoring harnesses technology to facilitate mentoring from remote locations. The Rods&Cones® medical smart glasses and platform allow remote experts to guide trainees through surgeries via real-time communication. Through a pair of hands-free medical smart glasses equipped with a camera worn by a trainee, a remote expert is able to immerse in the surgical field and mentor the trainee using multimedia synchronous communication in real time.
Material & Methods: This mixed-methods study is designed to evaluate the feasibility, utility and lived experience of the Rods&Cones® medical smart glasses and platform for remote mentoring of residents within the context of surgical training in Hand Surgery residency.
Surgical residents were recruited as trainees while Hand Surgery consultants were recruited as remote experts. They were introduced to the Rods&Cones® medical smart glasses and platform, and conducted simulated surgeries using dry models to familiarise themselves with the technology. The remote experts, physically situated in Khoo Teck Puat Hospital, then guided the trainees, located in Admiralty Medical Centre through commonly performed surgeries such as trigger finger release, carpal tunnel release and excision biopsy of lumps. The two remote locations are approximately 6 kilometres or 3.7 miles apart.
Participants then completed the validated System Usability Scale (SUS) questionnaire that quantitatively measure factors such as ease of use, comfort, confidence, and overall satisfaction with the system. Additionally, they participated in qualitative interviews to share their lived experiences, perceptions and attitudes toward the technology.
Results: The Rods&Cones® medical smart glasses and platform showed excellent perceived usability based on the average SUS scores from participants. Through the interviews, a majority of participants also expressed high satisfaction with the system and indicated strong interest in supporting the use of this technology in Hand surgery residency training. Details of the findings will be presented
Conclusions: This study demonstrated the feasibility of the Rods&Cones® medical smart glasses and platform for remote mentoring of residents within the context of surgical training in Hand Surgery residency. By allowing remote experts to guide surgical residents in real-time through hands-free smart glasses, the study demonstrates the utility of this approach in enhancing the training experience. Participants reported high satisfaction and perceived usability of the system,

indicating that such technology can effectively support surgical education, particularly in Hand Surgery residency training. Furthermore, the positive outcomes from this study suggest that remote mentoring could lead to improved skill acquisition and confidence among trainees. The findings pave the way for future validation studies to explore the impact of this technology on training-related outcomes, surgical performance, and patient safety. As surgical education continues to evolve, the integration of advanced tools like the Rods&Cones® medical smart glasses and platform could significantly enhance the quality of training and ultimately improve patient care.

A-0333 FUNCTIONAL OUTCOMES FOLLOWING METACARPAL-LEVEL HAND AMPUTATIONS: A CLINICAL REVIEW OF 14 CASES

Jędrzej Króliński, Janusz Kaczmarzyk, Leszek Kaczmarzyk, Marcin Syrko, Paweł Stajniak, Szymon Manasterski, Michał Chęciński, Piotr Węgrzyn, Maja Smorąg, Marta Jagosz, Ahmed Elsaftawy
Department of Plastic Surgery and Hand Surgery, Hospital of St. Jadwiga of Silesia in Trzebnica, Poland

Introduction: Metacarpal-level amputations present significant challenges in hand reconstruction due to their proximity to major joints and complex anatomical structures.
Aim: This study evaluates the functional outcomes of replantation in patients with metacarpal-level amputations, focusing on the influence of amputation extent and joint involvement on post-operative functionality.
Materials and Methods: A retrospective review was conducted on 14 patients who underwent replantation following metacarpal-level amputation. The cohort included 11 males and 3 females, with an average age of 39 years. Amputation patterns were classified as followed

- Involving fingers 2-4: 3 cases
- Involving fingers 2-5: 10 cases
- Involving the thumb and index finger: 1 case

Results: Successful replantation was achieved in 13 out of 14 cases, with only one case resulting in failure. Functional limitations were noted post-operatively, particularly in movements involving the metacarpophalangeal (MCP) joints, which impacted overall hand functionality due to restricted range of motion at this level. Functional outcomes varied depending on the number and position of digits involved in the amputation.
Conclusions: Metacarpal-level replantation can restore partial hand functionality, with a high success rate of 92.8%. However, limitations in MCP joint movement remain a notable challenge, underscoring the need for targeted post-operative rehabilitation. These findings highlight the critical role of amputation level and joint involvement in determining functional outcomes for hand replantation.

A-0335 BEYOND A SINGLE PLANE: COMPUTER-ASSISTED REVERSE WEDGE OSTEOTOMY FOR ENHANCED MULTIPLANE CORRECTION

Johannes GG Dobbe[1,2], Geert J Streekstra[1,2]
[1]Amsterdam UMC location University of Amsterdam, Biomedical Engineering and Physics, Amsterdam, the Netherlands; [2]Amsterdam Movement Sciences, Musculoskeletal Health - Restoration and Development, Amsterdam, the Netherlands

Introduction: Different techniques exist for post-traumatic correction of forearm deformities. One such technique is the reverse wedge osteotomy, where a wedge-shaped bone segment is cut and flipped by 180 degrees to achieve angular

alignment. Conventional treatment, such as using X-ray images to quantify the deformity, typically corrects angular deformation in a single plane. This approach may incorrectly ignore deformations in multiple planes.
Aim: To introduce and evaluate a novel automated technique that employs preoperative 3D planning of a reverse wedge osteotomy to restore alignment in multiple planes.
Methods: Our method uses the mirrored image of the contralateral healthy bone as a reference for position planning. During the planning phase, image segmentation is used to create virtual models of the affected and reference bones. Distal and proximal bone segments of the affected bone are then aligned with the reference bone to quantify the malalignment. An optimization technique is subsequently employed to determine the ideal location, angulation, and rotation of the wedge segment, ensuring the distal bone aligns as closely as possible with the planned position. Finally, the residual angular, rotational and translational positioning errors are quantified by comparison with the planned position. For evaluation of the method 10 preoperative CT-scans were selected of patients eligible for a correction osteotomy.
Results: Perfect multiplane angulation and rotation were achieved in all cases. Residual translation was minimal in the transverse direction. In particular cases, substantial shortening remained due to the bone defect.
Conclusion: Preoperative 3D planning of a reverse-wedge osteotomy enables angular, rotational, and translational correction in multiple planes, making it a valuable tool for future corrective osteotomy surgeries.

A-0336 THE ADVANTAGES OF ENZYMATIC DEBRIDEMENT IN UPPER LIMB BURNS - PREVENTING THE OCCURRENCE OF COMPARTMENT SYNDROME

Dan Cristian Moraru[1,2], Andra Bulgaru[1,2], Alexandru Amarandei[2], Stefana Luca[1,2], Malek Benamor[2], Mihaela Pertea[1,2]
[1]'Grigore T. Popa' University of Medicine and Pharmacy Iasi, Romania; [2]'Sf. Spiridon' Emergency Hospital Iasi, Romania

Introduction: Burn induced compartment syndrome is a potentially serious consequence following circumferential deep burns of the extremities. Standard treatment involves prompt escharotomy +/- fasciotomy to relieve subdermal and intracompartimental pressure, thereby preventing further tissue damage. Current guidelines recommend intervention at preasssures exceeding 30 mmHg. Early treatment of circumferential burns of the extremities with an enzymatic agent based on bromelain can represent a less traumatic and invasive procedure both for the treatment of the burn and also to avoid the development of a compartment syndrome.
Aim: The aim of our study is to assess the efficacity of enzymatic debridement in the early treatment of upper extremity circumferential burns versus classic surgery methods.
Material & Methods: A single-center, 3 year randomized controlled trial was conducted from january 2021 to december 2023, involving 30 patients, aged over 18 years old, with IIA and deep IIB and III-degree circumferential burns on the distal upper limbs, all presenting with unestablished compartment syndrome or in some cases with early signs of onset. Patients were assigned to receive either standard surgical escharotomy (n=16), followed by excision and skin grafting in 7 cases or enzymatic debridement with a Bromelain-based enzymatic agent (n=14), followed by skin grafting in 5 cases and spontaneous reepithelisation in 9 cases. Inclusion criteria: circumferential deep burns of the hand and/or forearm, flame or scald burns, patient consent. Exclusion criteria: more than 72 hours at presentation, chemical or electric burns, confirmed allergy to bromelain and coagulation disorders. Treatment efficacity was evaluated based on the values of the creatin-kinase, pain scores, healing time, functional outcomes measured by the Disabilities of the Arm, Shoulder and Hand (DASH) score, as well as patient satisfaction (VAS score).
Results: In the cohort, the Bromelain-based enzymatic agent group (A) demonstrated faster creatin kinase levels reduction by half compared to the surgical group (B), achieving values under 4000 U/L within 36 hours on average, versus 48 hours in

the surgical group. Pain levels, assessed by VAS, decreased by an average of 60% within 24 hours post-treatment in group A, compared to 40% in group B ($p<0.05$). Patients treated with a Bromelain-based enzymatic agent achieved 50% faster wound healing, with a median time to epithelialization of 16 days compared to 24 days for the surgical group. Functional outcomes at 3-month follow-up indicated a 25% greater improvement in grip strength and a 15 degree increase in wrist range of motion in the Bromelain-based enzymatic agent group. Moreover, when reviewing the results of the DASH score, at 6 months follow-up, group A had a mean score of 15 compared to group B which had a mean score of 25 points.
Conclusions: The results of this study suggest that enzymatic debridement offers significant benefits over classic surgery in avoiding burn induced compartment syndrome. The Bromelain-based enzymatic agent's ability to reduce pain swiftly, with faster healing times, highlights its potential as a safer, less invasive option. This supports its expanded use in burn-related compartment syndrome management, warranting further multicenter trials to establish best practices and long-term outcomes.

A-0337 DIFFERENTIAL COMPLIANCE OF PATIENT REPORTED OUTCOMES IN A HAND AND WRIST REGISTRY IN SWITZERLAND

I Besmens[1], M Gunning[2], O Politikou[3], M Calcagni[1]
[1]Hand Institut Zürich, Zürich, Switzerland; [2]Universität Zürich, Zürich, Switzerland; [3]Universitätsspital Zürich, Zürich, Switzerland

Introduction: Outcomes registries are vital for evaluating treatment effectiveness, especially in hand and wrist surgery, where both patient-reported (PROMs) and clinician-reported (CROMs) measures are essential. Consistent engagement is critical for reliable data. This study examines age and gender variations in compliance within a Swiss hand and wrist surgery registry.
Aim: We hypothesize that within a structured hand and wrist surgery outcomes registry, questionnaire completion compliance will vary at different time points, distinguished by age and gender demographics.
Material & Methods: Adopting the International Consortium for Health Outcomes Measurement (ICHOM) guidelines for Hand and Wrist Surgery, we initiated a multi-center registry in Switzerland in 2020. This registry collects both patient-reported outcome measures (PROMs) and clinician-reported outcome measures (CROMs), tracking adherence at baseline, 3 months, and 12 months post-treatment across multiple centers.
Results: Compliance rates for PROMs declined across all age groups from intake to the 12-month follow-up. The most significant decrease occurred in the youngest participants (18-30 years), where compliance plummeted by over 90% by the 12-month mark. In contrast, participants aged 61-70 began with the highest compliance rates and displayed the smallest decline, indicating stronger adherence over time. Females consistently maintained higher compliance rates than males throughout the study, with their initial advantage decreasing slightly but still evident at 12 months.
Conclusions: The study highlights the importance of patient and surgeon engagement in outcome registries and underscores the necessity for tailored strategies to address compliance challenges, particularly in younger populations and among men. The findings advocate for enhanced registry management, information technology improvements, and overall compliance strategies in the long-term management of hand and wrist surgery outcomes.

A-0338 THE USE OF COLLAGEN-BASED FILLER FOR TRAPEZIOMETACARPAL OSTEOARTHRITIS. LONG-TERM FOLLOW UP AND FUTURE APPLICATIONS

Umberto Lavagnolo[1,2], Massimo Corain[1]

[1]Hand Surgery Unit - Regional reference center for Hand Surgery and Microsurgery – Polo Confortini - University Hospital of Verona, Veneto, Italy; [2]University of Verona, Veneto, Italy

Introduction: Trapeziometacarpal osteoarthritis, a debilitating hand condition, elicits pain, stiffness, and weakness, leading to compromised hand function and strength. Non-surgical interventions mainly comprise activity modifications, administration of nonsteroidal anti-inflammatory drugs (NSAIDs), splinting, and corticosteroid injections. Following unsuccessful conservative treatment, various surgical techniques are available. A common classification for this condition is the Eaton-Littler classification, which categorizes it into four stages based on radiographic joint degeneration.
ChondroFiller Liquid®, a cell-free collagen scaffolds made from native type I collagen and chondrostimulating factors, is utilized to form a protective layer around cartilage defects. It stimulates chondrocyte growth, facilitating cartilage regeneration. A previous study demonstrated that ChondroFiller Liquid® effectively alleviates painful symptoms, enhances grip strength (assessed via the Jamar test and Pinch testS), improves Patient-Reported Outcome Measures (PROMs) as indicated by the Disabilities of the Arm, Shoulder, and Hand (DASH) score, and reduces MRI-assessed bone edema and periarticular effusion in patients with trapeziometacarpal osteoarthritis during a 12-month follow-up period.
Aim: This study extends the follow-up to 24 months to clinically assess the sustainability of clinical improvements. We also present a case report regarding the use of collagen-based filler in a patient with early-stage radiocarpal osteoarthritis.
Material & Methods: Forty patients from the initial study were enrolled, categorized into two severity groups according to the Eaton-Littler classification. At 18 months post-ChondroFiller Liquid® infiltration (time 1), all patients underwent clinical re-evaluation using the Numeric Rating Scale (NRS) and DASH score. Subsequent re-evaluation at 24 months post-infiltration (time 2) included the Jamar test, Pinch test, NRS, and DASH score. In addition to these patients, an additional 51 patients underwent infiltration with a mean follow-up of 14 months, of which 9 had already been treated in the preliminary study.
Regarding the case report, a 56-year-old patient with early-stage post-traumatic radiocarpal osteoarthritis was treated with the application of the filler under arthroscopic guidance. This patient represents the first use of this device for the radiocarpal joint.
Results: The findings indicate a sustained improvement in pain symptoms, coupled with increased strength in pincer and grip movements observed through clinical tests at the 18-month mark. However, a subset of patients demonstrated a reduction in clinical benefits during the 24-month follow-up.
The patient treated for radiocarpal osteoarthritis reported satisfactory clinical and functional improvement at the 12-month follow-up
Conclusions: Collagen-based filler emerges as a viable alternative to surgery, demonstrating efficacy in mitigating the progression of painful symptoms and functional limitations, even in the long term. The observed clinical improvements support the use of infiltrative approaches, potentially delaying or obviating the need for subsequent surgical interventions.

A-0339 ACHIEVING OUTCOMES WITH THE HAND AND WRIST STANDARD SET IN MULTI-CENTER SETTINGS

Maurizio Calcagni[1], Inga Besmens[1], Olga Politikou[2], M Gunning[3]
[1]Hand Institut Zürich, Zürich, Switzerland; [2]Universitätsspital Zürich, Zürich, Switzerland; [3]Universität Zürich, Zürich, Switzerland

Introduction: In recent years, standardized outcome measurement in hand and wrist surgery has become increasingly important for quality assessment and improvement of patient care. The International Consortium for Health Outcomes Measurements (ICHOM) developed the Hand and Wrist Standard Set to address this need, providing a comprehensive framework for evaluating treatment outcomes through both patient-reported and clinician-reported measures. Despite the potential benefits of such standardized assessment tools, their implementation across multiple healthcare centers presents unique challenges that require systematic investigation

Aim: Implementing the Hand and Wrist Standard Set by the International Consortium for Health Outcomes Measurements (ICHOM) in multiple centers across Switzerland aims to enhance patient care quality and offer insights into hand and wrist condition outcomes. We posit that utilizing patient-reported (PROMs) and clinician-reported outcomes measures (CROMs) will improve treatment strategies and patient satisfaction.

Material & Methods: In 2020, a comprehensive registry was initiated to integrate the Hand and Wrist Standard Set in routine practice across various Swiss centers, encompassing a wide array of conditions. A hybrid data collection approach using PROMs and CROMs was employed to capture both patient experiences and clinical outcomes comprehensively. Challenges in administration, IT logistics, and compliance were tackled by forming a dedicated support team, optimizing user interfaces for efficient data management, and promoting compliance through educational efforts and ongoing communication

Results: Initial findings from the implementation show a successful integration of the Standard Set in Switzerland, with extensive data collection offering valuable insights into hand and wrist condition outcomes. The combined use of PROMs and CROMs has effectively generated a rich dataset reflecting both patient and clinical perspectives, allowing for cross-center outcome comparisons and identification of treatment variability

Conclusions: The project has streamlined administrative procedures and IT logistics, enhancing compliance through educational outreach. Early results indicate a significant collection of comprehensive data. This hybrid data approach provides a well-rounded understanding of treatment impacts, supporting ongoing improvements in hand surgery practices and patient care quality. The initiative lays a robust foundation for outcome measurement and continuous care enhancement in the field.

A-0340 TREATMENT OF SEVERE DUPUYTREN'S DISEASE IN 2 STEPS: PROGRESSIVE DISTRACTION WITH EXTERNAL FIXATOR AND PERCUTANEOUS NEEDLE FASCIOTOMY. ONE-YEAR FOLLOW-UP

Umberto Lavagnolo[1,2], Massimo Corain[1]
[1]Hand Surgery Unit - Regional reference center for Hand Surgery and Microsurgery – Polo Confortini - University Hospital of Verona, Veneto, Italy; [2]University of Verona, Veneto, Italy

Introduction: Severe Dupuytren's disease (DD) remains a surgical challenge. Several minimally invasive treatment methods exist, including the use of a distractible angular external fixator (DAEF) followed by collagenase injection, currently withdrawn in most countries.

Aim: The purpose of this study is to investigate the combination of DAEF followed by percutaneous needle fasciotomy (PNF) in patients with advanced stage of DD.

Material & Methods: This prospective observational study evaluated 52 patients (56 DAEF implanted) with DD in stages

III-IV according to the Tubiana classification, assessing a progressive extension on the metacarpophalangeal and proximal interphalangeal joint (MP and PIP) through the application of DAEF, followed by the PNF on the palm and proximal phalangeal area. A post operative splint was applied, and patients were evaluated during a year by measuring the angle of extension deficit, the pain, the Disability of the Arm, Shoulder and Hand (DASH) scores, and the Patient and Observer Scar Assessment Scale (POSAS).
Results: Considering the pre-treatment deficit (MP 94±29°, PIP 67±28°), in all patients a statistically significant extension improvement was observed, with involvement of the PIP joint after the DAEF treatment (MP 90±28°, PIP 12±19°), and of the MP joint after the PNF procedure (MP 29±21°, PIP 11±18°). The DAEF distraction has not been painful (NRS 1.6±1.2). The application of a splint allowed the stabilization of the correction angle achieved (MP 18±17°, PIP 9±14°), which was maintained one-year post-procedure (MP 11±12°, PIP 12±15°). Comparing the pre-treatment DASH score (80.2±11.7 points), at 6 months a statistically significant improvement was found (9.7±6.7 points). At 6 and 12 months, the POSAS score indicated good quality of the surgical scars (44.9±4.5 and 37.6±8.0 points respectively). No complications were reported
Conclusions: The study assessed the effectiveness of progressive distraction with DAEF followed by PNF in patients with advanced-stage DD.

A-0341 RETHINKING SYSTEMATIC IMPLANT REMOVAL IN HAND SURGERY: A CRITICAL OUTCOMES REGISTRY ANALYSIS

Maurizio Calcagni[1], M Gunning[2], Olga Politikou[3], Inga Besmens[1]
[1]Hand Institut Zürich, Zürich, Switzerland; [2]Universität Zürich, Zürich, Switzerland; [3]Universitätsspital Zürich, Zürich, Switzerland

Introduction: Routine implant removal following hand surgery osteosynthesis has been a common practice, despite limited evidence supporting its necessity. While implant removal can address specific clinical issues such as hardware-related discomfort or functional limitations, the systematic approach to hardware removal regardless of symptoms warrants critical evaluation
Aim: This study, conducted using an outcomes registry in accordance with international guidelines, examines the hypothesis that systematic implant removal after osteosynthesis is frequently unwarranted, because only a minority of patients exhibit clinical signs necessitating such interventions
Material & Methods: A retrospective analysis was conducted on a cohort of patients who underwent hand surgery with screw or plate implantation over a three-year period. An outcomes registry, following the Hand and wrist standard set, established by the International Consortium for Health Outcomes Measurements (ICHOM), was used to collect both patient-reported outcome measures (PROMs) and clinician-reported outcome measures (CROMs). Medical records, radiologic assessments, and clinical follow-up data were systematically reviewed to identify cases in which implant removal was performed
Results: In the total cohort, only 25% of patients demonstrated clinical signs that could be attributed to the presence of implants. The majority of these signs were related to localized discomfort or mild limitation of hand function. 92% of patients displaying clinical signs after osteosynthesis had a complete resolution of clinical signs after hardware removal. PROMs and CROMs collected through the outcomes registry supported these findings, highlighting both subjective and objective aspects of patient outcomes
Conclusions: Systematic implant removal in hand surgery should be avoided, as evidenced by both clinical indications and outcomes registry data. This study argues for a more selective approach based on international guidelines and evidence-based decision-making. By rethinking the criteria for implant removal, we aim to optimize patient outcomes, minimize

unnecessary surgery, and reduce associated complications. This research has implications for refining guidelines in hand surgery, promoting evidence-based decision-making, and improving the overall quality of patient care.

A-0342 THE CLINICAL SIGNIFICANCE OF CUP ORIENTATION IN TOTAL ARTHROPLASTY OF THE THUMB CARPOMETACARPAL JOINT

Filippos Zigras, Theodoros Mylonas, Alexandros Koskiniotis, Efstathios Konstantinou, Alexandros Saridis, Nikolaos Stefanou, Sokratis Varitimidis, Efstratios Athanaselis
Department of Orthopaedic Surgery and Musculoskeletal Trauma, University of Thessaly, Larissa, Greece

Introduction: Dual mobility arthroplasty has gained traction in recent years as a treatment for arthritis of the thumb's basal joint. The orientation of the trapezium's cup remains a contentious issue.
Aim: The aim of this study is to evaluate the importance of cup inclination in relation to the final outcome.
Material & Methods: We retrospectively analyzed 31 total arthroplasties of the first carpometacarpal joint , assessing cup inclination in relation to the proximal pole of the trapezium and the scaphotrapeziotrapezoid (STT) joint level. All operations took place from 2021 to 2024 and the TOUCH Dual Mobility prosthesis was used. The average age of patients was 71 years (range 51–78), with 10 males (32.26%), and 18 right hands (58%), while the dominant upper limb was involved in 17 cases (55%). Functional outcomes and complication rates were evaluated to determine how cup orientation might influence the arthroplasty outcome.
Results: All patients were evaluated at a mean follow up of 18 months (6 months-30 months) after the time of surgery. The findings revealed that in the studied group, the cup was placed within a secure osteochondral area of the trapezium's distal pole, at an average abduction angle of 7.4° in the anteroposterior view and an average flexion angle of 8.58° in the lateral view, as determined by the surgeon's preference. This placement yielded satisfactory functional results with no cases of dislocation or signs of loosening during the follow up period. More particularly, the mean qDASH score was 5.68(0-25), the mean VAS score 0.33 (0-1), the mean Kapanji score 9.14 (9-10), the mean key pinch strength 13.5 (8-29) pounds and the mean grip strength 50.5 (16-95) pounds.
Conclusions: There is no evidence suggesting that successful outcomes in first CMC joint arthroplasty require the cup to be oriented parallel to the STT joint level.

A-0343 THUMB CARPOMETACARPAL IMPLANT ARTHROPLASTY IS HIGHLY COST-EFFECTIVE COMPARED WITH RESECTION-SUSPENSION-INTERPOSITION ARTHROPLASTY

Kei Mathis, Daniel B Herren, Stephan Schindele, Miriam Marks
Schulthess Klinik, Zurich, Switzerland

Introduction: A drawback of thumb carpometacarpal (CMC) implant arthroplasty is the higher surgical cost compared to using autologous tendon in resection-suspension-interposition arthroplasty (RSIA). However, we assume that the higher surgical cost of an implant is outweighed by the lower cost of post-operative care and the reduced cost of lost work productivity.
Aim: The aim was to perform a cost-utility analysis comparing thumb CMC implant arthroplasty with RSIA in the first year after surgery. Our primary hypothesis was that implant arthroplasty would be more cost-effective than the RSIA in the first year after surgery, with an incremental cost-effectiveness ratio below the proposed Swiss threshold of €106,000 per quality-adjusted life year (QALY).

Material & Methods: We included 80 patients with thumb CMC osteoarthritis who received implant arthroplasty (Touch®, Keri Medical) in our prospective clinical trial and compared the data with 39 patients with RSIA from a previous study. Quality of life (using the EQ-5D-5L questionnaire), direct medical costs and loss of productivity were calculated for up to 1 year after surgery. The incremental cost-effectiveness ratio, which is the costs of gaining one additional QALY, was calculated. Means and 95% confidence intervals (CIs) are presented.
Results: One year after surgery, quality of life was significantly higher in the implant group (EQ-5D-5L score = 0.90 [CI: 0.88-0.92]) compared to the RSIA group (0.86 [0.83-0.88], p≤0.01). Medical costs over the 1-year period were €2,131 [1,316-2,945] higher for implant patients compared to RSIA (p≤0.001), corresponding to the cost of the implant. In contrast, costs due to loss of productivity were €5,832 [275-11,388] lower for implant than for RSIA (p≤0.05). Total costs, including medical and loss of productivity costs, were slightly lower for implant patients (€25,277 [22,758-27,795]) compared to RSIA patients (€29,018 [22,625-35,411], p=0.19). This resulted in a negative incremental cost-effectiveness ratio of € -86,442 for implant patients compared to RSIA patients.
Conclusions: The calculated incremental cost-effectiveness ratio was far below the proposed Swiss threshold of €106,000, indicating that CMC implant arthroplasty with the Touch® prosthesis is a cost-effective intervention. In negotiations with health insurers, these data may support reimbursement of the cost of the implant.

A-0344 SURGICAL TREATMENT FOR ULNAR NEUROPATHY WITH CONCURRENT ULNAR NERVE DISLOCATION

Sota Saeki, Atsuhiko Murayama, Katsuhiro Tokutake, Masaomi Saeki, Hidemasa Yoneda, Katsuyuki Iwatsuki, Michiro Yamamoto
Nagoya University Hospital, Nagoya, Japan

Introduction: Ulnar nerve dislocation generally does not warrant surgical intervention, but surgery is indicated in severe cases. Comprehensive reports on the treatment of ulnar nerve dislocation are limited, and no consensus currently exists regarding optimal surgical methods
Aim: This study reviews surgical outcomes for cases of ulnar neuropathy with concurrent ulnar nerve dislocation treated at our institution
Material & Methods: This retrospective study includes 13 patients (16 limbs) with ulnar neuropathy and ulnar nerve dislocation surgically treated at our hospital from 2007 to 2023. The cohort included 8 men and 5 women, with an average age of 44 years (range: 14–70 years). Six cases were on the right side, four on the left, and three were bilateral. Preoperative symptoms included numbness in the ulnar nerve distribution (11 limbs), elbow pain (6 limbs), and muscle weakness (10 limbs). According to the preoperative assessment using the McGowan grading system, 4 limbs were grade I, 7 were grade II, and 5 were grade III. The mean preoperative motor nerve conduction velocity recorded from above the elbow to below it was 54 m/s (range: 26–66 m/s), with two cases below 50 m/s. The average amplitude ratio of the compound muscle action potential between the same points was 0.92 (range: 0.41–1.06), with two limbs under 0.8. All limbs underwent neurolysis. Additionally, 15 limbs had subcutaneous anterior transpositions, and 5 underwent partial medial spondylectomies. The mean duration from symptom onset to surgery was 29 months (range: 4–120 months). Evaluations included postoperative grip strength (compared to the unaffected side for unilateral cases), pain on the Numeric Rating Scale (NRS), the modified Bishop score, and reoperation rates
Results: Excluding bilateral cases, the postoperative grip strength ratio was 70% (range: 34–92%) relative to the unaffected side. Pain scores on the NRS improved from 5.4 preoperatively to 2.6 at final follow-up. The modified Bishop score at final assessment was Excellent in 3 limbs, Good in 7, Fair in 5, and Poor in 1 limb. Four limbs required reoperation due to

persistent or recurrent symptoms. The mean follow-up period was 24 months (range: 4–95 months)
Conclusions: Our findings illustrate the surgical outcomes for ulnar neuropathy with ulnar nerve dislocation treated at our institution. Cases requiring reoperation had not undergone partial medial epicondylectomy during initial surgery. It is possible that the poor results of those cases were due to the restriction of the ulnar nerve, which was originally mobile. Partial medial epicondylectomy should be considered to enhance outcomes in treating ulnar neuropathy with nerve dislocation.

A-0345 OUTCOMES OF OPEN REDUCTION AND INTERNAL FIXATION IN PROXIMAL HUMERUS FRACTURES: A RETROSPECTIVE STUDY

Theodoros Mylonas, Efstratios Athanaselis, Efstathios Konstantinou, Alexandros Koskiniotis, Aikaterini Sourmenidi, Nikolaos Stefanou, Michael Hantes, Theofilos Karachalios, Sokratis Varitimidis
Department of Orthopaedis Surgery and Musculoskeletal Trauma, University of Thessaly, Larissa, Greece

Introduction:Proximal humerus fractures are common injuries, particularly in elderly populations, often resulting from low-energy trauma. Management of these fractures remains challenging, as they frequently involve complex multi-part patterns, osteoporotic bone, and can be associated with complications such as avascular necrosis, malunion, and rotator cuff dysfunction. Open reduction and internal fixation (ORIF) using locking plate systems is a widely accepted treatment approach, aiming to restore anatomical alignment and shoulder function.
Aim: The study aims to evaluate the clinical outcomes, complication rates, and factors influencing prognosis following ORIF in proximal humerus fractures.
Material & Methods: We retrospectively reviewed 72 cases of proximal humerus fractures treated with ORIF at our institution between January 2012 and December 2023. Patients included were aged 45–82 years with Neer classification type II to IV fractures. Cases with previous shoulder surgery, pathological fractures, or follow-up less than 12 months were excluded. The primary surgical approach involved a deltopectoral incision with application of a proximal humerus locking plate. Functional outcomes were evaluated using the Oxford Shoulder Score (OSS) and the quick Disabilities of the Arm, Shoulder, and Hand (qDASH) score at the latest follow up. Complications such as infection, hardware failure, and avascular necrosis were documented.
Results: Of the 72 patients 52 were female (72%) and the rest were male, with a mean age of 65.8 years. They were evaluated postoperatively at a mean follow up of 32.4 months. Of the 72 patients, 65 (90.3%) achieved satisfactory fracture union. At the latest follow up the mean OSS was 53.4 (44-60), while the qDASH score was 20 (5-44). Patients with two-part fractures showed better functional recovery than those with three- or four-part fractures. Apart from fracture pattern, younger age (<70 years) was also a factor leading to better outcomes. Complications occurred in 10 cases (13.8%), with 4 cases of avascular necrosis treated with reverse shoulder arthroplasty or hemiarthroplasy, 3 superficial infections all managed non operatively with IV antibiotics and there were also 3 cases of malunion in varus position of the humeral anatomic neck leading to restriction of shoulder abduction.
Conclusions: ORIF offers reliable outcomes for proximal humerus fractures, especially in younger, active patients and in cases of two-part fractures. Successful outcomes are associated with precise anatomical reduction, stable fixation, and early rehabilitation. Complication rates remain notable, particularly in elderly patients and in complex fracture patterns. Future studies are recommended to explore augmentative techniques or alternative implants to improve fixation.

A-0346 STANDARDIZATION OF INTRINSIC HAND MUSCLE AREA USING ULTRASOUND AND ITS DIAGNOSTIC UTILITY FOR CARPAL TUNNEL SYNDROME

Keitaro Fujino, Koshiro Shimbo, Yukiko Yoshimura, Atsushi Yokota, Shuhei Otsuki
Osaka Medical and Pharmaceutical University, Osaka, Japan

Introduction: Ultrasound imaging of intrinsic hand muscles area is a well-established method for assessing neuromuscular disorders. However, its diagnostic accuracy for carpal tunnel syndrome (CTS) is limited because of the variability in normal values influenced by patient-specific factors, such as body size and sex

Aim: This study aimed to standardize intrinsic hand muscle area by calculating expected normal values based on individual patient characteristics and using these values as a reference for the measured values. By employing the ratio of observed to predicted values, we sought to enhance the diagnostic precision of ultrasound in detecting CTS

Material & Methods: The study enrolled 50 healthy adults (25 males, 25 females; mean age 37.6 years) and 17 CTS patients (6 males, 11 females; mean age 66.8 years), involving 100 hands from healthy participants and 20 hands from CTS patients. Ultrasonography was employed to measure the cross-sectional area (CSA) of the abductor pollicis brevis (APB) and first dorsal interosseous (FDI) muscles in transverse view. Additional parameters including height, weight, wrist circumference, and hand length were also recorded. To derive normal values, stepwise multiple regression analysis was performed with the CSA of the APB and FDI as dependent variables and patient background factors (e.g. sex, wrist circumference, and hand length) as explanatory variables. A regression formula was developed based on the data from healthy participants. Using this formula, the predicted normal CSAs for the APB and FDI in patients with CTS were calculated. The observed CSA was expressed as a percentage of the predicted value (%APB and %FDI) for standardisation. These standardised values were subsequently analysed for diagnostic utility using receiver operating characteristic (ROC) curve analysis along with their correlation with CTS severity

Results: Regression analysis identified sex, estimated hand surface area (eHSA, calculated as wrist circumference $\times$ hand length), and height as significant independent factors influencing the CSA of both APB and FDI muscles. Regression equations were constructed yielding the coefficient of determination (R^2) of 0.704 and 0.737 for APB and FDI, respectively. Patients with CTS exhibited a significantly lower mean %APB (68%) than healthy individuals, whereas %FDI was less affected (97%). The cutoff value for %APB was 88%, with an area under the curve (AUC) of 0.94, a sensitivity of 0.85, and a specificity of 0.73. Correlations between %APB and CTS severity were strong ($\rho = -0.82$), notably higher than the correlation seen with raw APB CSA prior to standardisation ($\rho = -0.61$)

Conclusions: Although the diagnostic accuracy of %APB was comparable to that of median nerve CSA and raw APB CSA measurements in previous studies, standardisation offered a unique advantage in identifying mild CTS cases with minimal muscle atrophy. This improvement highlights the potential of %APB as a sensitive tool for the early diagnosis of CTS.

A-0347 THE ULNAR FINGERS EXTENSION INCREASES THE ACCURACY OF FINGERTIP POSITION DURING PULP PINCHING

Runa Kamikawa, Hiroshi Kurumadani, Shota Date, Toru Sunagawa
Graduate School of Biomedical & Health Sciences, Hiroshima University, Hiroshima, Japan

Introduction: In hand therapy, the reacquisition of precise pinching movements for the disabled hand is an important program. However, it is unclear what instructions were given by the therapist during the pinching exercise. People may unconsciously extend their ulnar fingers to perform pinching movements with their thumb and index finger from an early

age without being taught, however, the details of the significance of extending the ulnar fingers have not been determined.
Aim: The present study focused on the accuracy of the pinching action and sought to clarify the effect of the ulnar fingers position on the accuracy during pulp pinching.
Material & Methods: Twenty-one healthy adults performed a pulp pinch task with the thumb and index finger. The task consisted of the pulp pinching with the ulnar fingers (middle, ring, and little fingers) extended or flexed position for more than 35 repetitions at two different movement speeds of 60bpm and 180bpm. The subject's posture was chair seating with 90° elbow joint and 90° forearm supination. Markers were affixed on the nail of the thumb and index finger, and a three-dimensional motion analysis system with 15 infrared cameras recorded the displacement of the thumb and index fingertips during the task. From 20 consecutive pulp pinching out of 35, the fingertip distance (FD) and the coefficient variation (CV) of the FD between the thumb and index finger was calculated both in the ulnar fingers extended and flexed positions. The two-way ANOA was used for the statistical analysis.
Results: The mean FD were significantly different between the speeds, and those at 180 bpm were significantly longer than those at 60 bpm. The CV of the FD was significantly different between the speed × ulnar finger position interactions. The CV of FD in the extension position was significantly smaller at 180 bpm than that at 60 bpm. Furthermore, the CV of FD at 180 bpm was also significantly smaller in the extension than that in the flexion position.
Conclusions: This study shows ulnar fingers extension enabled precise, repeatable pulp pinching. It has been shown that the extensor digitorum of the index finger is connected to the extensor digitorum of the middle, ring, and little fingers by intertendinous connections, and that the adjacent fingers are most affected by the intertendinous connections. Therefore, the extensor digitorum of the index finger may have been strained due to the effect of intertendinous connections. In addition, it has been shown that muscle activity of the extensor digitorum and flexor digitorum around the index MP joint increases during pinching in ulnar fingers extension compared to pinching in flexion. Therefore, both the extensor and flexor muscles around the index finger MP joint were considered to stabilize the joint. For these reasons, Extensor tendon may have increased MP joint stiffness due to the immobilizing effect of the extensor tendon. Pinching in the ulnar fingers extension may be helpful in practicing accurate pulp pinching.

A-0348 CLINICAL RESULTS OF SYNOVIAL WRAP FOR RECURRENT CARPAL TUNNEL SYNDROME

Ryosuke Ikeguchi[1], Mahiro Kimura[2], Takashi Noguchi[2], Daichi Sakamoto[2], Terunobu Iwai[2], Kazuaki Fujita[2], Tetsuya Miyamoto[2], Shuichi Matsuda[2]
[1]Department of Rehabilitation Medicine, Kyoto University Hospital, Kyoto, Japan; [2]Department of Orthopaedic Surgery, Kyoto University Graduate School of Medicine, Kyoto, Japan

Introduction: In revision surgery for carpal tunnel syndrome, it has been reported that decompression followed by additional vascularized flap coverage has a higher success rate than simple decompression. However, there is no consensus about which flap should be used as the vascularized flap for median nerve coverage in revision surgery for carpal tunnel syndrome
Aim: The purpose of this study is to report the treatment results of synovial wrap in revision surgery for carpal tunnel syndrome. We hypothesized that this procedure would improve the patients' symptoms and functionality
Material & Methods: Ten patients (mean age: 73.7 years) with recurrent carpal tunnel syndrome treated with carpal tunnel release and median nerve synovial wrap were retrospectively followed up for at least one year. The physical assessments included pain visual analogue scale (VAS), Semmes-Weinstein (SW) monofilament test, manual muscle test (MMT), and the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire. The physical variables from before surgery and at final follow-up were compared

Results: The median nerve area SW test before surgery was red for two patients, purple for six patients and blue for two patients. The SW test at final follow-up was purple for one patient, blue for six patients and green for three patients. The abductor pollicis brevis MMT before surgery was 2 for six patients, 3 for two patients and 4 for two patients. The MMT at final follow-up was 3 for four patients, 4 for four patients and 5 for two patients. The SW test and MMT significantly improved. The mean VAS score was 76.5 ± 11.1 before surgery and 13.0 ± 10.3 at final follow-up. The mean DASH scores were 52.4 ± 17.1 before surgery and 19.3 ± 12.7 at final follow-up. The mean VAS score and DASH score at final follow-up were significantly lower than those before surgery

Conclusions: Significant improvements in sensory disturbance, muscle strength and pain relief were obtained after carpal tunnel release with synovial wrap. It is clear that the synovial wrap method is an effective procedure for treating recurrent carpal tunnel syndrome.

A-0349 DIFFERENCES IN MUSCLE ACTIVITY AND INTERMUSCULAR COORDINATION BETWEEN DOMINANT AND NON-DOMINANT HANDS DURING CHOPSTICK MANIPULATION

Hina Komi, Hiroshi Kurumadani, Kazuya Kurauchi, Shota Date, Toru Sunagawa
Graduate School of Biomedical & Health Sciences, Hiroshima University, Hiroshima, Japan

Introduction: In hand therapy, patients often attempt to reacquire chopstick manipulation with the non-dominant hand, but the reacquisition approach still relies on repetitive training of chopstick manipulation and requires a long period of time. Understanding the characteristics of intrinsic and extrinsic muscle activity of the dominant and non-dominant hand during chopstick manipulation may contribute to a new approach to reacquire chopstick manipulation with the non-dominant hand.

Aim: This study aimed to examine the characteristics of the muscle activity of the dominant and non-dominant hand during chopstick manipulation, and to assist in rehabilitation.

Material & Methods: Twenty-eight healthy adults participated, using chopsticks to pick up objects of different sizes with either their dominant hand (skilled manipulation) or non-dominant hand (unskilled). To examine muscle activity, surface electromyography measured muscle activities in the seven intrinsic (lumbrical, thenar, dorsal interosseous) and four (finger and wrist flexor and extensor) extrinsic muscles, and to capture muscle activity waveforms during the task. The obtained muscle activity waveforms were filtered using a bandpass filter (cutoff frequency of 20-450 Hz). Subsequently, the root mean square (RMS) for a duration of 1 s was computed, and the MVC ratio was derived from the RMS value for each muscle during the MVC assessment. The average of five consistent trials for each task was used as a representative value for each participant. To assess intermuscular coordination, a nonnegative matrix decomposition method was used as muscle synergy analysis to determine temporal patterns and muscle contributions. The extracted muscle synergies were evaluated for similarity using scalar products.

Results: Analysis showed that most intrinsic and extrinsic muscle activity levels did not differ significantly between the dominant and non-dominant hands, nor across objects of different sizes.

However, the results of muscle synergy showed that the dominant hand coordinated only the intrinsic muscles, while the non-dominant hand coordinated the extrinsic muscles in addition to the intrinsic muscles. Furthermore, the combination of cooperating muscles was found to differ between dominant and nondominant hands in the muscles of the lumbrical and thenar muscles.

Conclusions: In this study, we investigated the differences in muscle activity and intermuscular coordination between the dominant and non-dominant hands during chopstick manipulation, aiming to improve rehabilitation practices.

The results revealed that compared to the dominant hand, there were no significant differences in muscle activity in nine out of the eleven muscles in the non-dominant hand. However, distinct intermuscular coordination patterns were observed between the dominant and non-dominant hands. Therefore, enhancing the intermuscular coordination of the non-dominant hand to resemble that of the dominant hand is crucial for efficiently improving chopstick skills during dominant hand exchange.

A-0350 SOFT TISSUE COVERAGE OF HAND AND DIGITAL DEFECTS USING PERFORATOR AND LOCAL PEDICLED FLAPS: CLINICAL OUTCOMES IN 28 PATIENTS

Piotr Węgrzyn, Janusz Kaczmarzyk, Leszek Kaczmarzyk, Paweł Stajniak, Jędrzej Króliński, Szymon Manasterski, Michał Chęciński, Maja Smorąg, Marta Jagosz, Patryk Ostrowski, Ahmed Elsaftawy
Department of Plastic and Hand Surgery, Szpital im. Św. Jadwigi Śląskiej, Trzebnica, Poland

Introduction: Soft tissue defects of the hand and digits present a complex reconstructive challenge due to the need for durable, pliable coverage that preserves functionality and aesthetic appearance. Perforator flaps have become a preferred option, offering vascularized tissue coverage with minimal donor site morbidity.
Aim: This study assesses the clinical outcomes and effectiveness of perforator flaps in hand and digit reconstruction.
Material & Methods: A retrospective review was conducted on 28 patients (24 males, 4 females; mean age: 46.2 years) who underwent soft tissue coverage of hand or digital defects using perforator flaps. Patient outcomes, including flap viability, functional recovery, and complications, were analyzed to determine the outcome.
Results: Successful coverage was achieved in 27 of 28 cases. Complications included one complete flap failure and one instance of partial flap necrosis. Functional recovery was satisfactory in the majority of cases, with good preservation of hand and finger mobility and aesthetic outcomes
Conclusions: Perforator and local pedicled flaps provide reliable, functional coverage for soft tissue defects of the hand and digits, with a high success rate (96.4%) and minimal complications. This study supports the use of perforator flaps as an effective option in hand reconstruction, though meticulous planning and monitoring are essential to prevent complications such as flap failure and necrosis.

A-0351 TRAPEZIOMETACARPAL ARTHRODESIS NONUNION TREATED WITH TRAPEZIOMETACARPAL ARTHROPLASTY: A SALVAGE PROCEDURE CASE REPORT

Ana Rubio, Juan Moreno, Joan Domingo, Guillem Claret
Hospital del Vendrell, Spain

Trapeziometacarpal arthrodesis is an operative technique indicated on trapeziometacarpal osteoarthritis grades II and III for young patients. It is well known that non-union rates can be up to 29% (depending on series), eventhough that radiological image does not always translate in clinical symptoms. In case of need for a salvage procedure, various options such as re-arthrodesis with bone grafting or any kind of trapeziectomy have classically been described. In the last few years, the option of a total trapeziometacarpal arthroplasty as a salvage procedure after trapeziometacarpal arthrodesis failure has been considered as a valid treatment option, being reported in the literature.
We present the case of a 57 y/o women who underwent trapeziometacarpal arthrodesis with percutaneous compression screws after being diagnosed with trapeziometacarpal grade II-III osteoarthritis. Four years after the surgery the patient

presented with pain, Kapandji score 5/10 and DASH score 73/100, radiological non-union was observed and a CT scan was performed. Non-union was established but trapezium height was still >8mm and no adjacent joints (scapho-trapezio-trapezoid) were affected. We proposed a salvage procedure with a total trapeziometacarpal arthroplasty, which the patient accepted. No early complications were observed and 3 months after the surgery the patient had full range of motion, correct thumb length and had no pain whatsoever. One year follow-up showed EVA 0, Kapandji score 9/10 and DASH score 20/100. We conclude that total trapeziometacarpal arthroplasty should be considered a good salvage procedure after a failed trapeziometacarpal arthrodesis, with early introduction to day-to-day activities and good outcomes, such as described in recent literature.

A-0352 A QUANTITATIVE STUDY INTO GENERAL PRACTITIONER EXPERIENCE AND CONFIDENCE WITH CONTRACEPTIVE SUBDERMAL IMPLANT DEVICES

Lylas Aljohmani[1,2], Linda Kelly[2], Louise Fitzgerald[3], Ms Roisin Dolan[1,2]

[1]Department of Plastic & Reconstructive Surgery, St. Vincent's University Hospital, Dublin, Ireland; [2]Department of Surgery, Royal College of Surgeons in Ireland, Dublin, Ireland; [3]Irish College of General Practitioners, Dublin, Ireland

Introduction: Long-acting reversible contraceptives (LARCs), including subdermal contraceptive implants (SCIs), are pivotal in modern contraceptive practices. This study investigates the experiences and practices of general practitioners (GPs) regarding subdermal contraceptive implant insertion and removal, aiming to assess their confidence, knowledge of guidelines, identification of complications and appropriate management referral.

Methods: A prospective quantitative survey of subdermal implant experience in a GP cohort study was conducted. A survey using a validated questionnaire was conducted among 100 general practitioners using Qualtrics software. Data was analysed with SPSS v29.0.

Results: A total of n=74 full responses were collected. Results showed that while a majority (94.6%) have inserted subdermal contraceptive implants, confidence levels varied, with 37.3% feeling confident in insertion and removal procedures. Notably, 39.2% were unaware of updated guidelines from January 2020. Statistical analyses revealed significant associations between general practitioners' reported experience in subdermal contraceptive implant procedures and confidence in these skills ($p < 0.001$), as well as awareness of guidelines ($p = 0.011$). General practitioners with greater experience tended to refer complicated cases to specialist services, contrasting with less experienced peers managing cases independently.

Conclusion: This study underscores the need for enhanced General Practitioners' training on subdermal contraceptive implant procedures and guideline updates to optimise service delivery. Given the increasing popularity of subdermal contraceptive implants, addressing these gaps is crucial for ensuring safe and effective contraceptive care in primary care settings.

How this fits in: Long-acting reversible contraceptives (LARCs), such as subdermal contraceptive implants (SCIs), are well-established for their safety and efficacy across diverse populations and are an increasingly popular form of contraception. General Practitioners (GPs) play a critical role in prescribing, inserting, and removing these devices, yet little is known about their experiences and confidence in the identification of complications and appropriate management referral. Our research highlights significant gaps in General Practitioners ' knowledge of updated guidelines and variability in their confidence and management practices. This study underscores the need for enhanced training and guideline dissemination, which is crucial for enhancing the delivery of this service within a primary care setting.

A-0354 QUALITY OF LIFE AND FUNCTIONAL OUTCOMES IN PATIENTS WITH WRIST OSTEOARTHRITIS

Satu Vihelä, Marius Kemler
Martini Hospital, Groningen, Netherlands

Introduction: Wrist osteoarthritis severely affects hand function and quality of life. Despite several surgical options, its impact on health-related quality of life (HRQoL) and functional outcomes remains underexplored. This study evaluates the impact of wrist osteoarthritis on HRQoL and functional outcomes from a societal perspective, and investigates the effect of surgical treatment on these outcomes.
Aim: This ongoing study aims to assess the impact of wrist osteoarthritis on HRQoL and functional outcomes. Additionally, the study will compare different surgical treatments to identify the most effective approaches for improving patient well-being and clinical decision-making.
Material & Methods: This prospective, single-centre cohort study collected data from patients undergoing salvage surgery for wrist osteoarthritis over 3.75 years, with a mean initial follow-up period of 3 months (range 6–13.5 weeks). Pre- and postoperative HRQoL, function, and pain were measured using the EuroQol Five Dimensions Health Questionnaire (EQ-5D-3L), Patient Rated Wrist/Hand Evaluation (PRWHE), Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH), and numerical rating (NRS) scales. Data were analysed using paired t-tests ($p<0.05$).
Results: A baseline mean EQ-5D index value (where 0=death and 1=perfect health state) of 0.63 was found, comparable to values seen in colorectal cancer, chronic obstructive pulmonary disease, and heart failure. For reference, the EQ-5D index value for carpal tunnel syndrome is 0.75. Postoperative data showed significantly improved HRQoL at 3 months postoperatively (mean +0.071, 95% CI [−0.001, 0.142]). The pain relief was also significant (mean -2.571, 95% CI [−3.148,−1.199]), as was the improvement in PRWHE (mean -18.268, 95% CI [−21.762,−14.774]).
Conclusions: Surgery for wrist osteoarthritis significantly improved functional outcomes and HRQoL already at 3 months. However, HRQoL remained lower than in other comparable musculoskeletal conditions, indicating that the disease burden continues to impact patient well-being. 3 months is still a short follow-up period, and further analysis with longer follow-up will assess the definitive improvements and help determine whether specific surgical treatments offer superior long-term outcomes.
Keywords: Health-related quality of life, Functional outcomes, Wrist osteoarthritis, Proximal row carpectomy, Four-corner fusion, SLAC/SNAC wrist

A-0356 WHY AM I SHAKING? A VALIDITY STUDY OF A NOVEL CLINICAL TEST OF SENSORIMOTOR CONTROL OF THE HAND

Benjamin Hägglund[1], Johan Jirlén[2], Christina Brogårdh[3], Elisabeth Ekstrand[4], Ulrik Röijezon[2]
[1]Department of Clinical Sciences, Lund, Orthopedics, Lund University, Sweden; [2]Department of Health, Education, and Technology, Luleå University of Technology, Luleå, Sweden; [3]Department of Health Sciences, Lund University, Lund Sweden, Department of Neurology, Rehabilitation Medicine, Memory Disorders and Geriatrics, Skåne University Hospital, Sweden; [5]Department of Hand Surgery, Skåne University Hospital, Sweden

Introduction: The sensorimotor control of the hand is crucial for daily activities and may be compromised by disease or injury, impacting patients' independence. The lack of feasible, accurate, and affordable clinical tools for hand proprioception assessment poses a challenge, being essential for identifying dysfunction and to evaluate treatment effects.
Aim: The aim of this study was to evaluate the concurrent validity of the LeapMotion controller (LMC) for assessing hand proprioception using a pointing acuity test.

Material & Methods: We compared the LMC with a 3D camera system for motion analysis (Qualisys Motion Capture, QTM), known for its high measurement accuracy as the gold standard. Twenty participants (10 men, 10 women), 15 without and 5 with hand injury or pain, took part in this cross-sectional study. Assessments included pointing acuity with open and closed eyes using the right and left hand, respectively. The outcome measure was the mean or median absolute error (AE) in millimeters (mm) of 10 trials. The Intraclass Correlation Coefficient (ICC) was used to analyze the relationship between measurements and the Bland-Altman together with 95% Limits of agreement (LOA) was used to evaluated agreement between LMC and QMC.
Results: There were moderate to good correlations between LMC and QTM performed with the eyes closed, with intraclass correlation coefficient (ICC) values of 0.6 and 0.89. In contrast, tests with the eyes open showed a poor overall correlation with ICC between 0.003 and 0.3. Bland-Altman analysis showed small median biases of ≤ 1.5 mm between LMC and QTM with the eyes open, but larger, ≤ 5.1 mm, with the eyes closed. Limits of agreement ranged from -0.4 to 3.5 mm with the eyes open and -31.6 to 21.5 mm with the eyes closed
Conclusions: The results indicate that the LMC could be a cost-effective and feasible tool for quantifying pointing acuity with a clinically acceptable bias. The median biases were small for measurements with eyes open, but the ICCs were poor, which could be due to a high pointing acuity within the group combined with limited variability between the participants in the eyes open tests.

A-0357 THE EFFECT OF PARTHENOLIDE ON FUNCTIONAL NERVE REGENERATION AND NEUROPATHIC PAIN FOLLOWING MEDIAN NERVE INJURY AND EPINEURIAL RECONSTRUCTION IN A RAT MODEL

Jana Ritter[1], Cosima Prahm[1], Manuela Büttcher[1,2], Thomas Wuttke[3,4], Philipp Gobrecht[5], Dietmar Fischer[5], Adrien Daigeler[1], Jonas Kolbenschlag[1], Johannes Heinzel[1,6,7]
[1]Department of Hand-, Plastic, Reconstructive and Burn Surgery, BG Klinik Tuebingen, Eberhard Karls University Tuebingen, Tuebingen, Germany; [2]Facility for Animal Welfare, Veterinary Service and Laboratory Animal Science, Eberhard Karls University Tuebingen, Tuebingen, Germany; [3]Department of Neurology and Epileptology, Hertie Institute for Clinical Brain Research, University of Tuebingen, Tuebingen, Germany; [4]Department of Neurosurgery, University of Tuebingen, Tuebingen, Germany; [5]Centre for Pharmacology, University of Cologne, Cologne, Germany; [6]Ludwig Boltzmann Institute for Traumatology - The research center in cooperation with AUVA, Vienna, Austria; [7]Austrian Cluster for Tissue Regeneration, Vienna, Austria

Introduction: Despite optimal surgical therapy, nerve injuries frequently result in functional deficits and chronic neuropathic pain. Tension-free epineurial coaptation remains the gold standard for the treatment of transection injuries. In a murine axonotmesis model of the sciatic nerve, it was demonstrated that a single administration of Parthenolide, a natural component of feverfew, accelerated nerve regeneration.
Aim: The aim of this study was to examine the impact of Parthenolide on functional regeneration following neurotmesis and epineurial reconstruction of the rat median nerve.
Material & Methods: Male Wistar rats (n=30) underwent transection and direct reconstruction of the median nerve using epineurial sutures in one forelimb. In the contralateral forelimb, 15 mm of the nerve was resected and the nerve stumps were sutured into the surrounding muscles to prevent spontaneous regeneration. Postoperatively, rats were randomly assigned to one of three groups: 1. Daily injection of Parthenolide (200ng/kg body weight) for 20 days, administered alternately intravenously or intraperitoneally; 2. 20 applications of Parthenolide (200ng/kg body weight) over 12 weeks; 3. Control group. For 12 weeks postoperatively, functional nerve regeneration was evaluated weekly by using the Grasping Test and the Von Frey Test. At the end of the observation period, the flexor digitorum supeficialis muscles innervated by the median nerve were resected and weighed.

Results: Following the initial loss of grasping strength, the first animals exerted measurable grasping strength three weeks postoperatively. From week 11 onwards, the animals receiving daily Parthenolide for 20 days exhibited higher mean grasping strength compared to the other groups, although without reaching statistical significance. Injury and reconstruction of the median nerve initially resulted in hyposensitivity in the areas innervated by the median nerve, followed by the development of mechanical allodynia two weeks after surgery, which persisted until the end of the observation period. However, the Parthenolide-treated groups demonstrated reduced allodynia compared to the control group. The reconstruction of the median nerve using epineurial sutures had a discernible impact on neuropathic pain. The weight of the flexor digitorum superficialis muscle was significantly higher on the reconstructed side ($p<0,001$) than on the non-reconstructed side. However, no significant difference in muscle weight was observed between the different groups.
Conclusions: Following median nerve injury and epineurial reconstruction, Parthenolide not only improved nerve regeneration but also exhibited a pain-relieving effect.

A-0358 SYSTEMATIC REVIEW AND META-ANALYSIS ON OPTIMAL DURATION OF IMMOBILIZATION FOR CONSERVATIVELY TREATED DISPLACED DISTAL RADIUS FRACTURES

Zhixue Lim[1], Shubashri Jeyaratnam[1], Jin Xi Lim[1], Soumen Das De[1], Sandeep Sebastin[1], Vieda Lusa[2], Teemu Karjalainen[3]
[1]National University Hospital Singapore; [2]Central Finland Healthcare District, Jyväskylä, Finland; [2]Department of Hand and Micosurgery, Tampere University Hospital, Tampere, Finland

Introduction: Distal radius fractures (DRFs) are common and they exhibit a bimodal pattern. Generally, undisplaced fractures are treated conservatively with immobilisation. In contrast, displaced DRFs are initially managed with manipulation and reduction, followed by immobilization, before determining whether surgery is necessary. Evidence indicates that elderly patients with displaced DRFs often achieve comparable outcomes with conservative management as with surgical intervention. While the indications for surgery in DRFs have been established, the optimal duration of immobilisation remains unclear. To address the uncertainty regarding immobilization duration and its impact on outcomes for displaced DRFs, we conducted a systematic review and meta-analysis of randomized controlled trials, focusing on outcomes and complication data for non-operatively treated cases.
Aim: The aim of this review was to assess the benefits and harms of different immobilization times for people with displaced distal radius fractures.
Material & Methods: We included full-text randomized controlled trials and quasi-randomized trials that examined participants with displaced distal radius fractures. These participants were randomly assigned to either a shorter duration of wrist immobilisation (intervention) or a longer duration (control), regardless of the type or position of the immobilisation device. We searched MEDLINE (via PubMed) and the Cochrane Central Register of Controlled Trials (CENTRAL) to identify all published randomised controlled trials. Two reviewers independently assessed the titles and abstracts to identify potentially eligible studies, then reviewed the full text and registry records of these studies. They also extracted study details and outcome data independently. Any disagreements at any stage were resolved with input from a third reviewer. Our primary outcome of interest was hand function, while secondary outcomes included pain, clinical improvement or global satisfaction, health-related quality of life, return to work, adverse effects, grip strength, range of motion, and secondary displacement. We focused on analysing outcomes over the long term (6 months to 2 years) and reviewed outcomes at short-term (up to 6 weeks, and between over 6 weeks to 3 months) and medium-term (over 3 months to 6 months) intervals. We evaluated the certainty of evidence for each outcome using GRADE criteria.
Results: The search yielded 2,262 potentially relevant records. After duplicate removal, we screened the titles and abstracts

of 1,720 records and reviewed the full texts or registry entries for 40 of these. This systematic review and meta-analysis found that patient-reported outcome measures were comparable between shorter and longer immobilization of displaced DRFs at all time points. Pain scores showed no significant differences between 1-2 weeks and 3-5 weeks of immobilization. Similarly, range of motion was comparable between groups with 3-4 weeks and 5-6 weeks of immobilization. Additionally, no differences were observed in secondary dorsal angulatory displacement across any of the immobilization periods
Conclusions: These findings suggest that there is no benefit in extending the immobilization duration for displaced DRFs.

A-0359 PROXIMAL ULNAR NERVE INJURIES IN CONTINUITY; DETAILED NEUROPHYSIOLOGICAL- AND CLINICAL FOLLOW UP TWO YEARS AFTER MEDIAN TO ULNAR NERVE TRANSFER

Rasmus D Thorkildsen[1], Inge Petter Kleggetveit[2], Frode Thu[1], Lise Maurstad Madsen[3], Bjørg Bolstad[3], Magne Røkkum[1,4]
[1]Oslo University Hospital, Division of Orthopaedic Surgery, Norway; [2]Section of Clinical Neurophysiology, Department of Neurology, Oslo University Hospital, Norway; [3]Section for Orthopaedic Rehabilitation, Division of Orthopaedic Surgery, Oslo University Hospital, Norway; [4]Institute of Clinical Medicine, University of Oslo

Introduction: There are still unanswered questions and controversies regarding the reversed end-to-side median to ulnar nerve transfer
Aim: To strengthen outcome assessment after this nerve transfer by a detailed neurophysiological- and clinical assessment 2 years post surgery
Material & Methods: Prospective cohort study of patients with subtotal, proximal ulnar nerve injuries within 1.5 years prior, and persisting distal motor and sensory deficits. Nine patients were included, five males and four females, median age 71 (28-73) years. Four had injuries at plexus level (one iatrogenic, three sequelae after shoulder dislocation/fracture. One patient had a persistent ulnar nerve deficit after blunt trauma to the upper arm, and the remaining four patients had injuries at elbow level in conjunction with elbow trauma and related surgery (fractures/dislocations). Nerve transfers were performed at 9 (6-11) months after initial injury. Two patients received end-to-end (ETE) transfers, the remainder supercharged end-to-side (SETS) transfers. Patients were followed for 2 years with clinical (Rosen score, dynamometer assessment, Quick DASH) and neurophysiology (nerve conduction studies, thermal thresholds and EMG with a specific assessment for a median to ulnar nerve connection) performed at baseline, 9, 12 and 24 months. Results are expressed as median (range) and non parametric statistic analysis was performed with p values < 0.05 considered significant.
Results: There were no complications. The Rosen score, motor and sensory subdomains all improved significantly at 9,12 and 24 months, ending at 1.66 (1.23-2.45), 0.74 (0.42-0.93) and 0.40 (0.20-0.84) at final follow up respectively. The strengths of grip, key- tripod- and tip pinch also improved significantly ending at 77 (19-102), 60(32-89), 50 (14-114) and 58 (11-111) percent of the healthy hand. The quick DASH was significantly improved at 12 and 24 months, with 27,3 (2,3-72,3) at 24 months. Positive Froment sign and clawing was seen in 6 and 3 patients respectively at final follow up. There were detectable motor unit potentials (MUPs) in both abductor digiti minimi (ADM) and first dorsal interosseous (1DI) in all patients at final follow-up. The compound muscle action potential (CMAP) improved significantly to 18.5 % of the healthy hand for ADM at 24 months and thermal thresholds then approached near normal levels. We were only able to demonstrate a functioning transfer for the 2 ETE patients and 1/7 SETS patients at final follow up
Conclusions: The patients improved from 9 months on. Both ETE transfers were found to be functioning. The study raises questions about the utility of the SETS transfer in clinical practice.

A-0360 PROLONGED IMMOBILIZATION INCREASES THE RISK OF STIFFNESS IN CHILDREN WITH ELBOW DISLOCATIONS

Varshini Babu, Amanda Pang, Nakul Talathi, Joseph L Yellin, Apurva S Shah
Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

Introduction: Ulnohumeral (elbow) dislocations are uncommon injuries in children that can lead to poor outcomes including joint contracture and recurrent instability. While the incidence of ulnohumeral elbow dislocations has been reported, the outcomes following conservative treatment are less well-described.
Aim: This study aimed to estimate the incidence and identify risk factors of stiffness in non-operatively-managed patients.
Material & Methods: A retrospective cohort study of children with ulnohumeral elbow dislocations treated non-operatively from 2010-2024 at a single children's hospital was conducted. Patient records and radiographs were reviewed for demographics, treatments, and complications. Patients who failed to achieve a return to functional range of motion (as defined by >120 degrees arc of motion) were included if they had a minimum of 3 months of follow-up. Patients were excluded if they had a metabolic bone disorder, were diagnosed with a congenital dislocation, or underwent initial operative treatment for the acute dislocation or an associated fracture. Descriptive analysis was performed to determine the incidence of elbow stiffness and Fisher tests, Wilcoxon Rank Sum tests, and Logistic Regression analysis were used to identify associated risk factors.
Results: 105 patients (53.3% female) with a median age of 10.4 (IQR: 8.7-13.8) years were included. The majority of the patients had a posterior or posterolateral elbow dislocation (95.2%; 100/105), while 2.9% (3/105) had a posteromedial dislocation and 1.9% (2/105) had an anterior dislocation. 40% of cases were true "simple" elbow dislocations with no associated fracture (42/105). Fractures of the inferior pole of the medial epicondyle (16.2%) and coronoid (11.4%) were the most common associated fractures. The overall incidence of posttraumatic stiffness (overall arc of motion <120°) was 13.3% (14/105). Age, sex, and associated fracture did not increase risk of stiffness. The median length of immobilization was significantly greater for those who experienced elbow stiffness (21.5 vs. 15.0 days, p=0.018). The odds of elbow stiffness were 5.6 times greater among patients who had ≥20 days of immobilization (p=0.003). Four patients underwent downstream surgery due to the severity of joint contracture. A single patient experienced recurrent posterolateral rotatory instability due to insufficiency of the lateral ulnar collateral ligament (LUCL) and also required surgery
Conclusions: The overall incidence of elbow stiffness (range of motion < 120) was 13.3%. Prolonged immobilization (greater than 3 weeks) increased the risk of contracture by fivefold. Therefore, early mobilization in pediatric elbow dislocations is important to avoid joint stiffness.

A-0361 PERCENT – DEVELOPMENT OF CARPAL TUNNEL RELEASE INCIDENCE IN FINLAND

Mikael Hytönen[1,2], Aukusti Savolainen[1], Aleksi Reito[3], Yrjänä Nietosvaara[1,2], Ville Mattila[4], Matti Juntunen[2], Mikko P Räisänen[2,4]
[1]Department of Orthopaedics, Traumatology and Hand surgery, Kuopio University Hospital, Kuopio, Finland, 3 School of Medicine, University of Eastern Finland, Kuopio, Finland; [3]Tampere University Hospital, Center for Musculoskeletal diseases, Tampere, Finland; [4]Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland

Introduction: Carpal Tunnel Syndrome is the most common peripheral nerve entrapment syndrome in Finland and worldwide. In Finland, over 60% of patients are treated surgically. The "Stress-related hand and forearm diseases" guidelines issued in 2007 recommended that an electromyography should be performed prior to surgical intervention. In Finland, the development of carpal tunnel release (CTR) incidence has not been studied previously

Aim: The primary aim of this study was to assess the trend in CTR incidence in Finland from 2005 to 2021. Additionally, we investigated possible changes in CTR settings (operating room vs procedural room) in university hospitals
Material & Methods: We analysed the incidence of carpal tunnel surgeries in Finland between 2005 and 2021. Data was obtained from the Finnish National Hospital Discharge Registry, and population data was sourced from Statistics Finland. Incidence was calculated per 100 000 person years
Results: Between 2005 and 2021, CTR was performed on 51,132 men and 103,060 women. From 2005 to 2019, the incidence of CTR increased by an average of 1.33% per year. During the COVID-19 pandemic in 2020–2021, the incidence of these operations declined significantly (Table 1). Among men, the prevalence of CTR increased by an average of 2.20% per year, while for women it increased by 0.97% per year. There are differences in the setting of CTR between university hospitals and the use of procedural rooms has increased
Conclusions: The incidence of CTR rose between 2005 and 2019, with a sharp decrease observed during the COVID years of 2020–2021. The increase of incidence was lower than in other western countries. As health care costs are rising, cost-effective solutions for surgical treatment should be considered in future. Further research is needed to understand the underlying causes of the increase in CTR incidence.

A-0363 VALIDATION OF A SMARTPHONE APPLICATION AND WEARABLE SENSOR FOR ACCURATE MEASUREMENTS OF COMPLEX WRIST MOVEMENTS

Fredrik Engstrand, Jonas Svingen, Simon Farnebo
Department of Hand Surgery and Plastic Surgery, Linkoping University Hospital, Sweden

Introduction: We conducted a validation study of WristCheck, an iOS smartphone-based application that utilizes an IMU sensor to assess wrist motion. Our objective was to evaluate the accuracy of the application and sensor by comparing it to a motion capture (MoCap) system with six high-precision Qualisys cameras. The validation focused on capturing the complex wrist movements, dart thrower's motion and circumduction, which are critical in both functional evaluation and rehabilitation outcomes.
Aim: To establish an accurate and accessible method for measuring complex wrist movements
Material & Methods: Twenty healthy participants underwent two test sessions, following the test-retest protocol. During each session, wrist motion was measured concurrently with WristCheck and the MoCap system. Data analysis included intraclass correlation (ICC) to assess reproducibility and agreement between the two systems, as well as Bland-Altman plots to evaluate potential systematic differences
Results: Conclusions: The results demonstrated high levels of agreement between WristCheck and the MoCap system, with no statistically significant differences in measurement accuracy in either circumduction or dart throwers motion ($p > 0.05$). ICC values indicated excellent test-retest reproducibility for both WristCheck and MoCap (ICC >0.9), affirming the reliability of WristCheck for measuring complex wrist motions.
This study establishes WristCheck as a valid and reliable tool for assessing complex wrist motions, comparable to a high-precision MoCap system. Our findings suggest that WristCheck could serve as a feasible, accessible option for outcome tracking in clinical settings and post-surgical rehabilitation, offering substantial potential for enhanced patient monitoring and targeted therapeutic interventions.

A-0364 NITEP-GROUP: DISTAL RADIUS FRACTURE TRIAL (DRIFT): NON-OPERATIVE TREATMENT VERSUS SURGERY WITH VOLAR LOCKING PLATE IN THE TREATMENT OF DISTAL RADIUS FRACTURE IN PATIENTS AGED 65 AND OLDER – A PROSPECTIVE, MULTICENTER, RANDOMIZED CONTROLLED TRIAL

Teemu Hevonkorpi, Antti Launonen, Aleksi Reito, Ville Mattila, on behalf of the NITEP-group
Tampere University Hospital, Tampere, Finland

Introduction: Nearly half of all distal radius fractures (DRF) occur in patients aged 65 years and older. In this age group, non-operative treatment has been suggested as the primary treatment. However, operative treatment gained wide popularity after the introduction of volar locking plates (VLP) in the early 2000s.
Aim: The primary aim of the study was to compare non-operative treatment to volar plating in the treatment of initially malaligned DRFs, and DRFs with early instability during the cast treatment in patients aged 65 and older with the primary outcome of patient-rated wrist evaluation (PRWE) in 12 months.
Material & Methods: This study was a prospective, multicenter, multinational, randomized controlled trial conducted in five trauma centres in Finland, Sweden and Denmark. Patients aged 65 years and older with a dorsally dislocated AO type A or C DRF were included in the study. Patients with primarily unstable fractures (Cohort I) were randomly assigned in block allocation fashion with a 1:1 ratio to non-operative treatment with a dorsal cast (arm 1) or operative treatment with VLP (arm 2). Patients with early fracture malalignment in 7 to 10 days follow-up (Cohort II) were also randomized in 1:1 to either continue cast treatment (arm 3N) or to receive surgery with VLP (arm 3O). Patients with no malalignment in the first follow-up visit continued cast treatment (arm 4). Patients who declined the randomization formed an external validation group with the same treatment options and controls. The follow-up visits were arranged in 7 to 10 days, 5 to 6 weeks, 3 months, 12 months and 24 months.
Results: Between March 2018 and June 2023, 277 patients aged 65 and older, treated for a DRF were included in the study. The 12-month results of this randomized controlled trial will be offered for presentation in the FESSH 2025 congress.
Conclusions: The conclusions of this randomized controlled trial will be offered for presentation in the FESSH 2025 congress.

A-0365 SATISFACTORY RATE AFTER FINGER AMPUTATION (SMALL FINGER) IN RECURRENT DUPUYTREN DISEASE

Arne Tenbrock, Martin Lautenbach
Waldfriede Hospital Berlin, Berlin, Germany

Introduction: High grade recurrent dupuytrens disease (DD) (St. III & IV) can be a difficult challenge for patients and hand surgeons due to pain, functional impairment, stiff fingers, problems in soft tissue reconstruction and woundhealing.
Aim: We did a retrospective analyse of the satisfaction rates after amputation of Dig V at MP level in recurrent DD stage IV.
Material & Methods: We searched our database and found 35 patients in 11 years with this kind of therapy (amputation at MP Level, using fillet flap with wrap around from dorsal to palmar).
We investigated following parameters: sex, age, occupation, reasons for amputation (arthrosis, pain, immobility, nerve affection, perfusion disturbance, soft tissue obstacles) Quick DASH pre- and postoperative, NAS pre- and postoperative; affection of N8, functional impairment, satisfaction with therapy
Results: There was a response rate of 80% (28 pat.). M/F - 20/8; mean age 64y; 60% manual worker.
Of 28 Patients, 24 had re- recurrent stage IV disease after 2-4 operations.
The main reason for amputation was a combination of immobility/ stiff finger, soft tissue problem and whether pain or arthrosis of PIP.

Quick DASH pre (29) vs. post Op (11); NAS pre (7) to post (2); affection of N8 in 5 cases; subjective better grip and functionality of the hand in 95%.
Only 1 of the 28 would not share the same decision again du to pain in N8 and aesthetic problems after amputation
Conclusions: For hand surgeons, the decision to amputate a finger, is hard to handle with. There are a few indications like infections, tumor, residual problems after trauma replantation, where it is a valuable or necessary therapy option. In recurrent DD it can be the only realistic option to improve the hand function, regarding a painful, stiff, impeding "claw" finger with a long history of operations, hand therapy and destinating progress of the disease.
The results in our study underline the option of amputation of the small finger in therapy resisting cases with high satisfactory rates.

A-0366 FINGER KINEMATICS AND JOINT STIFFNESS AFTER TREATMENT OF INTRA-ARTICULAR FRACTURES OF THE PROXIMAL INTERPHALANGEAL JOINT

Gabriella Fischer[1], Esin Rothenfluh[2], Lisa Reissner[3], Bill Taylor[4], Maurizio Calcagni[1]
[1]University Hospital Zurich, Switzerland; [2]Inselspital Bern, Switzerland; [3]Balgrist University Hospital, Zurich, Switzerland; [4]Institute for Biomechanics, ETH Zurich, Switzerland

Introduction: Injuries of the proximal interphalangeal (PIP) joint of the fingers are difficult to treat, given that posttraumatic stiffness is very common and can severely affect hand function.
Aim: The aim of this study was to quantify PIP joint stiffness in patients after different treatment of intra-articular PIP fractures and to assess the relationship to finger kinematics.
Methods: Twenty-six patients with thirty intra-articular PIP joint fractures and a minimum follow-up time of 2 years were included. They were assigned to three different treatment groups: conservative (n=13), dynamic external fixation (DEF, n=9) or open surgical procedures (OSP, such as ORIF, corrective osteotomy, n=8).
Motion analysis was used to measure the range of motion (ROM) during dynamic finger flexion-extension as well as during nine daily activities. The stiffness of the affected PIP joint and the contralateral healthy side was measured using a newly developed finger stiffness measurement device. Axis deviation in the PIP joint was determined radiologically. PIP joint stiffness and ROM difference to the contralateral healthy side was compared between the different treatment groups (Kruskal-Wallis test, alpha=0.05). Pearson correlation was calculated.
Results: Median stiffness of the PIP joint was 0.0029Nm [0.0010-0.0066Nm] for the healthy and 0.0037Nm [0.0019-0.0057Nm], 0.0044Nm [0.0020-0.0055Nm] and 0.0049Nm [0.0028-0.0077Nm] in the DEF, conservative or OSP group, respectively. PIP joints were significantly stiffer after OSP, compared to healthy joints.
Median ROM restriction of the PIP joint was significantly larger after DEF (82°) and OSP (79°), compared to conservative treatment (104°). In addition, a significant reduction of the DIP ROM (47°) and compensatory increase in movement of the MCP (114°) was observed after OSP, compared to the conservatively treated group (DIP 79°, MCP 103°).
A significant correlation was found between increased PIP joint stiffness and maximal PIP ROM ($R=0.59$, $p<0.001$) as well as DIP ROM ($R=0.57$, $p<0.001$), whereas MCP ROM correlated negatively with PIP joint stiffness ($R=-0.41$, $p=0.02$). The PIP joint motion during the daily activities also correlated with PIP joint stiffness ($R=0.65$, $p=0.0002$). Axis deviation tended to correlate with PIP joint stiffness ($R=0.36$, $p=0.062$).
Discussion: The ROM of the PIP joint was more restricted after surgical intervention (DEF and OSP) compared to the conservatively treated joints, while open surgical procedures additionally affected DIP ROM (19° reduction of DIP ROM). Compensatory movements in the MCP >10° were observed in ~1/3 of the surgically treated fingers, but not after

conservative treatment. However, different indications and a large inter-subject variability need to be considered. Overall, increased PIP joint stiffness correlates with restricted ROM in the PIP and the DIP joint and with compensatory movement of the MCP. This was observed also for functional tasks that require only a small portion of the joint's full ROM.

A-0367 RESULTS OF SPINAL ACCESSORY NERVE TO SUPRASCAPULAR NERVE TRANSFERS IN CHILDREN WITH BRACHIAL PLEXUS BIRTH INJURY

Maria Hyttinen[1], Henrikki Rönkkö[2], Pasi Paavilainen[3], Mika Helminen[4], Jarkko Jokihaara[1,2]
[1]Faculty of medicine and health technology, Tampere University, Tampere, Finland; [2]Division of musculoskeletal diseases, Tampere University Hospital, Tampere, Finland; [3]Pihlajalinna Hospital, Tampere, Finland; [4]Tays Research Services, Tampere University Hospital, Tampere, Finland and Faculty of social sciences, health sciences, Tampere University, Tampere, Finland

Introduction: Shoulder external rotation after brachial plexus birth injury can be restored by transfer of the spinal accessory nerve to the suprascapular nerve, or more distally to its infraspinatus branch.
Aim: We studied the outcome of these nerve transfers in 52 patients with a minimum of 12 months and a mean of 7.3 years postoperative follow-up. The aim was to assess improvement in ER, whether one of the techniques results in better improvement, and how age at surgery is associated with the outcome.
Material & Methods: We collected information about clinical findings and symptoms at different time points, age at surgery, type of nerve transfer and preoperative and postoperative range of motion in shoulder external rotation. As most of the patients did not have any active external rotation in preoperative assessment, improvement of 90° was regarded as the limit for clinically meaningful improvement resulting in at least half of the full range of external rotation.
Results: The median postoperative improvement in shoulder external rotation was 120° (IQR 45 to 135) after anterior and 110° (IQR 83 to 120) after dorsal spinal accessory nerve transfer to the suprascapular nerve main trunk, and 110° (IQR 80 to 125) after transfer to the infraspinatus branch. Patients operated after 20 months obtained ≥90° improvement in external rotation less frequently.
Conclusions: Spinal accessory nerve transfers to suprascapular nerve main trunk and infraspinatus branch are effective in restoration of shoulder external rotation in brachial plexus birth injury. The results of our study suggest that a decision about distal nerve transfer for shoulder external rotation is recommended at 1.5 years of age.

A-0368 KNOWLEDGE GAPS AND RADIATION EXPOSURE CONCERNS: TIME FOR A REVAMP OF RADIATION TRAINING STRUCTURES FOR TRAINEE SURGEONS

Lylas Aljohmani[1,2,3], Aoife Gaffney[2], Eric Heffernan[3,5], Colin Morrison[2,3], Roisin Dolan[1,2,4]
[1]Department of Surgery, Royal College of Surgeons in Ireland, Dublin, Ireland; [2]Department of Plastic & Reconstructive Surgery, St. Vincent's University Hospital, Dublin, Ireland; [3]UCD School of Medicine & Medical Science, University College Dublin, Ireland; [4]Department of Plastic & Reconstructive Surgery, Beaumont Hospital, Dublin, Ireland; [5]Department of Radiology, St. Vincent's University Hospital, Dublin, Ireland

Objective: This study aims to assess surgical trainee knowledge of occupational radiation exposure and safety, and prior attendance at radiation protection training. We also assessed compliance with the use of personal protective equipment (PPE) and attitudes and concerns relating to radiation exposure.
Methods: Design: This cross-sectional quantitative study used a questionnaire-based survey through Qualtrics (1) , an online software program. The survey consisted of 3 sections addressing a) trainee demographics, b) radiation training

history and knowledge and c) attitudes and concerns towards radiation exposure.
Setting: Tertiary care hospitals located in Ireland.
Participants: Study participants included surgical trainees in six surgical disciplines regularly exposed to occupational radiation. Trainees of varying experience levels in trauma and orthopaedic surgery, urological surgery, vascular surgery, plastic and reconstructive surgery, general surgery and ear, nose and throat surgery were invited to complete the survey, distributed by the National Surgical Training Office at the Royal College of Surgeons in Ireland.
Results: There were 79 respondents to the survey (70% response rate) from 112 invited trainees. Radiation knowledge was poor with less than 10% of participants meeting the threshold to pass the knowledge survey. One-fifth of respondents had not attended a formal radiation safety course and 40% (31/78) had no prior fluoroscopic training. Concerns about the long-term effects of radiation exposure on fertility were reported in 62.5% (42/67) of respondents. Despite this, compliance with the use of PPE was low, with 8% (6/68) reporting full compliance with dosimeter use, 61% (42/68) compliance with thyroid shield use and only 13% compliance with eye protection (9/68). Further radiation safety training was requested by over 85% (57/67) of trainees.
Conclusions: This study demonstrates significant knowledge gaps and poor compliance with PPE use amongst surgical trainees. With a strong surgical trainee desire to seek out further radiation safety training, we propose a revamp of traditional training structures to deliver a modern, interactive, online national radiation safety training course.

A-0371 COMBAT-RELATED PERIPHERAL NERVE INJURIES PATTERNS AND PRELIMINARY OUTCOME ANALYSIS

Amir Arami, Firass Lahham
Sheba Medical Center, Israel

Introduction: Amidst the Gaza conflict since October 7th, a significant number of patients, exceeding 200 in a period of 6 months, have been attended to, with over 100 cases presenting combat-related peripheral nerve injuries (CRPNI). The existing literature lacks depth in addressing the management of these injuries, thereby accentuating the difficulties in diagnosing nerve injuries necessitating intervention and determining optimal exploration timing. Moreover, outcomes post-surgical interventions such as neurolysis, nerve repair, grafting, or transfers remain scarcely documented, particularly regarding early surgical interventions
Aim: This retrospective study endeavors to analyze the one-year clinical outcomes of surgically managed CRPNI cases
Material & Methods: Medical records of 108 military personnel with CRPNI were retrospectively reviewed. Data encompassed demographic information, injury specifics (including affected nerves), associated injuries like fractures, open wounds, or vascular damages, and management strategies. Over the span of one year, regular follow-up evaluations were conducted, assessing patient-reported outcomes through Michigan hand questionnaires, pain scores, sensory and motor recovery, range of motion, grip and pinch strength of affected limbs. The study also documented consecutive surgical interventions and ensuing complications.
Results: Among the 108 patients reviewed, 162 peripheral nerve injuries were identified, with 117 involving the upper extremities, and 43 sustaining co-injuries. Predominantly, the ulnar nerve sustained upper extremity injuries, while the sciatic nerve was commonly affected in lower extremities. Surgical exploration was undertaken in 139 affected limbs within 1-2 weeks post-injury. Ongoing collection of clinical data is in progress and will be presented after a one-year follow-up
Conclusions: CRPNIs represent a diverse range of injuries affecting multiple peripheral nerves, each posing distinct diagnostic and management challenges. Preliminary insights from this ongoing study into clinical outcomes may provide valuable guidance for managing and rehabilitating military personnel afflicted with CRPNIs.

A-0372 FRAILTY AND HAND FRACTURES: IS IT TIME FOR A PATHWAY?

Lylas Aljohmani[1,2,3], iulia Marinescu[1], Linda Kelly[1], Simone Kneafsey[1], Roisin Dolan[1,2,3]
[1]Department of Surgery, Royal College of Surgeons, Dublin, Ireland; [2]Department of plastic and reconstructive surgery, St Vincent Hospital, Dublin, Ireland; [3]Department of Plastic and reconstructive surgery, Beaumont Hospital, Dublin, Ireland

Abstract: Introduction: Upper limb fractures from low-velocity trauma often indicate frailty in older adults, stemming from a decline in physiological reserve and function. No specific frailty pathway exists for frailty investigation and treatment in hand fracture cases.
Aim: To assess the awareness of specialist plastics/ortho surgeons and hand therapists of frailty intervention services and previous utilisation of these services in patients over the age of 65 years. To understand the impact of frailty status on how these groups approach intervention and management of patients in the setting of hand fractures.
Methods: An online survey was disseminated to specialist hand therapists and orthopaedic and plastic reconstructive surgeons. The questionnaire included 16 items assessing respondents' current practices and frailty management in hand fractures.
Results: The total number of respondents was n = 41 (n = 21 Consultant hand surgeons, n = 21Hand Therapists) who completed the full survey. Therapists report greater awareness of available frailty assessment pathways and FIT in their working environment (p = 0.002). Plastic/reconstructive surgeons reported lower rates of awareness of FIT services compared to their orthopaedic colleagues (p = 0.040). Similarly, orthopaedic surgeons reported higher rates of previously availing of FIT services, compared to their plastics counterparts (p = 0.010).
Conclusion: Frailty is a significant consideration in managing hand fractures in older adults. However, there is a lack of clear guidance on frailty assessment and referral pathways. Establishing standardised guidelines by hand societies and health services is recommended.

A-0373 CLINICAL PRESENTATION AND PATIENT-REPORTED FUNCTION IN CHILDREN WITH SPRENGEL'S DEFORMITY

Julianna Lee[1], Eliza Buttrick[1], Carley Vuillermin[2], Lindley B. Wall[3], Julie Balch Samora[4], CoULD Study Group, Apurva S Shah[1]
[1]Division of Orthopaedics, Children's Hospital of Philadelphia, Philadelphia, PA, USA; [2]Department of Orthopaedic Surgery, Boston Children's Hospital, Boston, MA, USA; [3]Department of Orthopaedic Surgery, Washington University School of Medicine, St Louis, MO, USA; [4]Department of Orthopedics, Akron Children's Hospital, Akron, OH, USA

Introduction: Sprengel's deformity is a rare congenital anomaly of the scapula with limited data of the resulting impact on physical function. We hypothesize that children with Sprengel's deformity will have reduced shoulder range of motion, but that metrics of psychosocial wellbeing will demonstrate less anxiety and depression than the normal population.
Aim: The aim of this study was to objectively characterize initial clinical presentation and quantify both range of motion and patient-reported function in children with Sprengel's deformity.
Material & Methods: Children with Sprengel's deformity were prospectively enrolled into the multicenter Congenital Upper Limb Differences (CoULD) Registry between 2012-2023. Shoulder range of motion and patient-reported outcomes (PROs) data were collected from the patient's most recent pre-operative follow-up and compared to normative values. PROs included the Pediatric Outcomes Data Collection Instrument (PODCI) and PROMIS Depression, Anxiety, Peer Relations, and Upper Extremity domains. Univariate analysis was performed between bilateral, syndromic, and Cavendish subgroups.
Results: In total, 59 patients (31, 52.5% female) were included with median age of 5.9 years at most recent evaluation. Most patients (53, 89.9%) presented with a unilateral deformity and a minority of cases (13, 22.0%) were syndromic,

predominantly Klippel-Feil Syndrome (9/13, 69.2%). Cavendish Grade III deformity was most common (31/61, 50.8%) followed by 24.6% Grade II, 14.8% Grade I, and 9.8% Grade IV. Average shoulder abduction (113°) and forward elevation (120°) were significantly less than normal range ($p<0.001$). Children with Sprengel's deformity reported less anxiety/depression than the normative population as indicated by a mean PROMIS Anxiety score of 44.5 ($p=0.017$) and a mean Depression score of 45.9 ($p=0.028$). Mean PROMIS Upper Extremity scores also trended lower than normative values. Patients scored significantly lower on PODCI Upper Extremity Function, Sports, and Global Function modules than the normative population ($p<0.05$). PODCI Transfer subscores significantly varied by Cavendish classification ($p=0.011$) with Grade 1 and 2 deformities scoring within the normal range (average 100.0 and 97.0, respectively) versus Grades 3 and 4 scoring below normal (average 91.0 and 93.5, respectively). Neither bilateral presentation nor syndromic association significantly affected PROs ($p>0.05$).

Conclusions: Children with Sprengel's deformity have decreased shoulder range of motion, specifically abduction and forward elevation which is worse in children with Cavendish Grades 3 and 4 deformities. Regardless of bilateral or syndromic presentation, patients generally demonstrated significantly lower physical function and sports abilities, but decreased anxiety and depression compared to unaffected populations.

A-0374 LONG-TERM MEASUREMENTS OF METACARPAL SUBSIDENCE AFTER THUMB TRAPEZIOMETACARPAL ARTHROPLASTY

Daniel Hinzpeter[12], Esteban Urrutia[12], Valentina Viancos[2], Vicente Alba[2]
[1]Clínica Las Condes, Santiago, Chile; [2]Facultad de Medicina Universidad Finis Terrae, Santiago, Chile

Introduction: Trapeziometacarpal thumb arthroplasty is a common procedure in the surgical treatment of symptomatic osteoarthritis. Trapezectomy is the standard procedure but produces a proximal migration of the thumb and Metacarpal. This subsidence can affect clinical function, for this reason various suspensionplasty techniques are used to prevent or stabilize this migration, but there is few evidence of its behavior over time.

Aim: The central objective of this study was to measure in the long-term the scapho-metacarpal space, in relation to the preoperative measure.

Material & Methods: 16 radiographs were evaluated, corresponding to 5 patients, with trapezio-metacarpal osteoarthritis of the thumb in Eaton stage III-IV, undergoing open trapeziectomy with suspension plasty and tendon interposition (LRTI). Measurements were made on 16 AP hand radiographs; 8 pre-operative and 8 post-operative. All radiographs were evaluated by 3 independent observers: 2 senior staff hand surgeons and 1 orthopedic resident.

The radiographs were performed by radiology technicians from Clínica Las Condes and measurements were made using the digital system PACS (Picture Archiving and Communication System).

The reviewers calculated trapezoidal space proportions using three different methods:

(1) trapezial space in relation to the length of the first metacarpal; (2) trapezial space in relation to the length of the proximal phalanx and (3) trapezial space in relation to the height of the capitate.

Patients underwent preoperative and postoperative AP hand radiographs.

Results:8 hands of 5 patients with an average age of 61.6 years at the time of surgery (55-74) were included.

Postoperative radiography was performed on average at 8.5 years, with a range of 5 to 10 years.

The average index of the trapezoidal space for the 3 methods; were for the Pre-Op: metacarpal: 0.25, capitate: 0.52 and proximal phalanx: 0.40, and for the Post Op: metacarpal: 0.09, capitate: 0.19, proximal phalanx: 0.14.

When evaluating the loss of space in the follow-up of the different patients, an average decrease of 63.47% (metacarpal),

64.35% (capitate) and 65.03% (proximal phalanx) was evident, of the index measured by comparing pre- and postoperative radiographs
The authors identify excellent agreement among the three mesaurements methods: metacarpal 1, phalanx 2, and capitate 3.
Conclusions: Arthroplasty of the CMC joint of the thumb performed with resection of the trapezius and LRTI plasty produces a collapse-subsidence of the scaphoid-metacarpal space.
This may be related to the clinical evolution; pain or lack of strength, but further information is needed to evaluate its behavior over time and its relationship with the patient symptoms.
This element may be an important one, when deciding whether to perform this surgery and maybe help to evaluate how predictable and reliable it is in the very long term.

A-0375 DEVELOPING A NOVEL IMPLANT FOR OSTEOARTHRITIS OF THE FINGERS

Alistair Phillips[1], Andy Taylor[2], Martin Browne[3], Pardis Farjam[4], Peter Tompson[5], Heithem Ben Amara[5], Charles Burson-Thomas[3]
[1]Private Practice, Hampshire, UK, [2]Aurora Medical Ltd, Chichester, UK, [3]Bioengineering Science Research Group, School of Engineering, University of Southampton, Southampton, UK, [4]Department of Biomechanical Engineering, Faculty of Engineering Technology, University of Twente, Enschede, the Netherlands, [5]Department of Biomaterials, Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Sweden,

Introduction: Osteoarthritis (OA) is a prevalent chronic joint disease, affecting over 600 million people worldwide, with increasing rates due to aging populations and obesity. Current surgical interventions for finger joint OA, such as fusion or joint replacement, are highly invasive and expensive, requiring extensive rehabilitation and resulting in suboptimal success rates compared to procedures for larger joints.
Aim: This research aimed to demonstrate the feasibility of the APRICOT® implant, a novel, minimally traumatic device designed to address the limitations of current surgical interventions for finger joint OA. The APRICOT® implant is an extremely thin, self-lubricating device that is placed between the articulating surfaces of the affected joint, offering a bone-conserving, low-trauma alternative to traditional implants.
Material & Methods: The APRICOT® implant's development process involved key design considerations, public and patient involvement, and rigorous mechanical and biological validation. Mechanical validation included representative finger joint simulator testing, while biological validation involved biocompatibility and gene expression analyses. An effective implantation strategy was developed and tested using a cadaver model.
Results: The APRICOT® implant demonstrated promising results in mechanical and biological validation tests, indicating its potential for clinical application. Implantation in a cadaver model confirmed the feasibility of the implantation strategy. The device's minimally traumatic nature, bone-conserving design, and self-lubricating properties offer significant advantages over conventional implant systems, including reduced procedure time, enhanced functional recovery, and reduced operation costs and rehabilitation time.
Conclusions: The APRICOT® implant represents a potential breakthrough in the treatment of finger joint OA. Its feasibility has been demonstrated through rigorous testing and cadaver model implantation. The device's minimally invasive nature and potential for improved clinical outcomes position it as a promising alternative to traditional surgical interventions. Future research will focus on further development, clinical evaluation, and potential applications in other surgical areas.

A-0376 CONCOMITANT VASCULAR INJURIES SIGNIFICANTLY DELAY TIME TO SURGERY FOLLOWING TRAUMATIC BRACHIAL PLEXUS INJURIES

Anuhya Vusirikala[1], Dhruv Vasooja[2], Dennis Hazell[1], Michael Fox[1], Marco Sinisi[1], Anna Panagiotidou[1]
[1]Royal National Orthopaedic Hospital, UK; [2]Imperial College London, UK

Introduction: In traumatic brachial plexus injuries (BPIs), delays in surgery contribute to poorer functional outcomes and increased complications.
Aim: This study assesses the contributing factors to the time to surgery including concomitant injuries, promptness of referral and review by the Peripheral Nerve Injury (PNI) specialist.
Material & Methods: This retrospective study evaluated all patients above the age of 16 who underwent surgery for traumatic BPIs in a tertiary PNI centre in the United Kingdom. Data was collected for a 5 year period (2019 to 2023) encompassing demographics, mechanism of injury, clinical timelines, and the influence of concomitant vascular and spinal injuries to time to surgery.
Results: Eighty patients (mean age 33 years, Male: female 74: 6) with a traumatic BPI were identified. 69 (86%) patients sustained a BPI due to a road traffic accident and 11 (14%) due to a fall from height, crush, penetrating or sports injury. The average time from date of injury to referral to our tertiary centre was 17 days. The average time taken from referral to triage by our PNI centre was 2 days and patients were seen in the PNI clinic within 22 days. In clinic, 51 (63%) patients were added to the waiting list for surgery and the remainder were either sent for further investigations (neurophysiology studies, radiology) or were monitored to assess for further recovery in function.
35 (43%) patients had concomitant spinal injuries and 16 (20%) had vascular injuries. There were 3 patients who had both spinal and vascular injuries concomitant with their traumatic BPIs. Time from date of injury to date of surgery for those who had concomitant spinal injuries was 93 days, concomitant vascular injuries was 111 days and those with both spinal and vascular injuries was 147 days. Time to surgery was significantly longer if vascular injury was present ($p=0.03$). Overall average time to surgery from date of injury was 96 days.
Conclusions: In the current literature, there is no consensus on the exact timing of surgery for traumatic BPIs but it is well known that shorter time to surgery results in improved functional outcomes and fewer complications. This study demonstrates that concomitant vascular injuries significantly delay time to surgery, it is still important to refer a patient to the PNI centre as soon as a traumatic BPI is suspected so as to begin formulating plans to perform surgery as soon as it is safe to do so.

A-0377 THE LOCKED METACARPOPHALANGEAL JOINT: DESCRIPTION AND OUTCOMES OF A NON-OPERATIVE TREATMENT

Alexandre Petit, Nicolas Bigorre
Centre de la Main, Angers-Trélazé, France

Introduction: So-called “locked finger” is a rare condition involving the locking of the metacarpophalangeal joint in flexion, with impossible active and passive extension. Locking of metacarpophalangeal joint (MPJ) of the fingers occurs when osteophytes of the metacarpal head catch the accessory collateral ligament
Aim: Our aim is to describe our fully non-operative approach to quickly restore the MPJ motion and to explain outcomes of our treatment
Material & Methods: We retrospectively reviewed the results of eight consecutive patients treated for a locked MPJ of a

finger. In all these patients, closed reduction with intra-articular injection of local anesthetic was successful. We analyzed osteophyte shape and height as demonstrated by X-rays. Function was evaluated by examining the range of motion, and recurrence. One male and seven female patients were followed for an average of 33 months. The average age of patients was 73. The average duration of locking of the MPJ was 13 days

Results: All these cases were successfully treated with manipulation after an intra-articular injection of a local anesthetic. None required open reduction. There was no recurrent locking after this procedure

Conclusions: We obtained very satisfactory outcomes in irreducible locking of the MPJ of the finger by using this simple closed reduction, with intra-articular injection of local anesthetic. Our experience suggests that manipulation could be enough in most of the cases. However, if it was unsuccessful, it should be followed by surgical treatment described in literature.

A-0378 ACUTE COMPARTMENT SYNDROME OF THE FOREARM AND HAND

Alexandra Titova, Ivan Dovgalevich
Belarusian State Medical University, Minsk, Belarus

Introduction: Acute compartment syndrome is a pathological condition characterized by an increase in intracompartmental pressure, leading to ischemic-necrotic changes in the tissues within the affected compartment and resulting in severe, disabling contracture of the fingers.

Aim: To improve the treatment outcomes for patients with acute compartment syndrome of the forearm and hand.

Material & Methods: The most effective and efficient method for the surgical treatment of acute compartment syndrome (ACS) of the forearm and hand is fasciotomy — decompression of the muscle compartments, which should be performed within a maximum of 8 hours, and in the presence of pathognomonic clinical signs, within 4 hours from the time of injury. To achieve the objective of the study, we evaluated the treatment outcomes of acute compartment syndrome of the forearm and hand at the City hospital from 2018 to 2023. During this period, treatment was provided to 5 patients with acute compartment syndrome of the forearm and 3 of the hand. Among these patients, 2 had brachial artery injuries, 1 had soft tissue damage against a background of thrombocytopathy, 2 had ulnar bone fractures, and 3 had metacarpal bone fractures.

Results: In analyzing the outcomes of treating ACS of the forearm and hand, we found that in 3 patients, fasciotomy was performed within 4 hours from the time of injury, with metacarpal fractures fixed with pins. The long-term treatment results were satisfactory, achieving full hand function recovery. In the patient with an isolated ulnar fracture, full finger and wrist joint movement was achieved 6 months post-injury. For the 86-year-old patient with ACS of the forearm following a ruptured brachial artery aneurysm, it was impossible to track the treatment outcomes due to the exacerbation and decompensation of comorbidities, which led to death. The most complex case was of recurrent acute compartment syndrome in a patient with thrombocytopathy following a soft tissue contusion. To alleviate pain and pathological condition, triple revision operation was required.

Conclusions: Acute compartment syndrome of the hand and forearm is a multifactorial pathological process. Pain is the main diagnostic sign, necessitating the involvement of an experienced trauma orthopedist in the treatment of patients at risk for developing ACS. Fasciotomy is the only method for treating acute compartment syndrome of the forearm and hand to restore segment function.

A-0379 FEATURES OF FIXATION OF DISTAL RADIAL METAPHYSIS FRACTURES

Alexandra Titova, Ivan Dovgalevich
Belarusian State Medical University, Minsk, Belarus

Introduction: Fractures of the distal radius are among the most common forearm bone injuries. For the fixation of complex and "non-standard" fractures of the radius, ex-fix devices and bridging plates are used, as well as their combination with volar plates or k-wire.
Aim: To compare the outcomes of using bridging osteosynthesis and external fixation with the Ilizarov frame for multifragmentary fractures of the distal metaphysis of the radius.
Material & Methods: At the trauma center, 13 patients with severe high-energy multifragmentary fractures of the distal radius were treated without volar plate. Surgical interventions were performed within the first 3 days for 12 patients, while in one case of multiple trauma, the surgical treatment was performed 3 weeks later. Bridging plate fixation was performed in 7 cases, and the Ilizarov frame was used in 6 patients, combined with a volar plate in one case. In three cases, a combination with k-wire was used in conjunction with the bridging plate.
Results: The long-term outcomes of all 13 patients were examined 6-12 months post-injury. The first difference between the two methods was observed in the duration of the surgical intervention: an average of 40 minutes for bridging osteosynthesis and 92 minutes for extra focal fixation with the Ilizarov apparatus. There was a difference in the duration of temporary disability leave, which was 4 months for the frame group and only 2.5 months for the bridging fixation.Patients with plates reported a much higher subjective sense of comfort and satisfaction with the treatment process, while those with extra focal apparatus experienced some difficulties in daily activities and certain discomfort in performing household tasks, as well as in caring for themselves and the frame. The development of finger movements began on the first day after surgery. Patients using the bridging fixator achieved full range of motion by the second week post-operation. In contrast, patients with the Ilizarov apparatus only reached full range of motion by the fourth week. Subjectively, patients appeared cautious about the apparatus techniques and rehabilitated in a gentle mode, fearing to perform exercises with full force. The treatment outcomes according to the DASH (Disabilities of the Arm, Shoulder, and Hand) scale were significantly better for patients after subcutaneous fixation, with ratings of "good" and "excellent," while the outcomes for patients with frame were rated as "good" and "satisfactory."
Conclusions: When comparing the two methods, the main advantage of using the bridging plate is the subjective feeling of comfort reported by all patients. The second significant advantage is the technical complexity of performing the surgical intervention, as evidenced by the operation time: 40 minutes for the bridging plate versus 90 minutes for fixation with the Ilizarov apparatus. However, each patient with a multifragmentary radius fracture requires an individualized approach when planning surgical intervention, and the answer to the question of the "ideal" fixator has not yet been found.

A-0380 COMPARISON OF TREATMENT FOR DORSAL CHIP FRACTURES OF THE TRIQUETUM AND PATIENT REPORTED OUTCOMES

Silvan Pasquinelli, Timo Tondelli, Sebastian Guenkel
City Hospital Zürich, Switzerland

Introduction: Triquetrum fractures are the second most common carpal fracture after scaphoid fractures with dorsal triquetrum chip fracture being the most common fracture type. There is little evidence about treatment of these fractures.
Aim: To study non-operative treatment with a wrist orthosis compared to a cast. Furthermore, the duration of

immobilisation is analysed. Incidence and outcomes of isolated dorsal triquetrum chip fracture and in combination with concomitant ipsilateral upper limb injuries were studied.
Material & Methods: Retrospective case series including 39 patients with an average age of 48 years who were treated with either cast or splinting for 4 to 6 weeks for isolated or concomittant dorsal chip fractures of the Triquetum. Time to radiological healing was monitored. Time of and type of immobilization was analyzed. Patient reported outcomes (PRWE and Quick DASH) as well as range of motion were compared.
Results: Of the 39 patients 11 patients were females and 28 males. Mean age was 48 years (median 52 years, range 22-76 years). 21 patients were treated with a prefabricated wrist cuff and 18 in a closed forearm cast. Median time of immobilisation was 6 weeks (range 3-9 weeks). 28 cases had an isolated dorsal cortical chip fracture, in 11 cases another ipsilateral hand, wrist and elbow lesion was found. All fractures healed. We found no difference in patient reported outcome measures, range of motion (ROM) and function for isolated dorsal triquetrum fractures in terms of type and time of immobilisation. Conservative treatment of these fractures resulted in good overall outcomes (PROMs, ROM), whereby ROM was slightly better for isolated injuries compared to combined injuries.
Conclusions: Dorsal chip fractures of the Triquetum can be treated non-operatively with good patient reported and clinical outcomes regardless of immobilisation modality and duration. 4 weeks of immobilization in a prefabricated wrist orthosis is sufficient and yields comparable and good outcomes.

A-0381 HEALTH RELATED QUALITY OF LIFE IN DUPUYTREN'S DISEASE AND CHANGE AFTER SELECTIVE FASCIECTOMY

Patrick Buurke, Marius Kemler
Martini Hospital, Groningen, the Netherlands

Introduction: Dupuytren's disease, characterized by progressive finger contractures, significantly limits hand function and reduces quality of life for affected individuals. Selective fasciectomy is the preferred surgical approach aimed at improving hand mobility, though comprehensive insights into its impact on post-operative quality of life remain limited.
Aim: This study investigates the specific effects of selective fasciectomy on quality of life, focusing on pain, physical disability, and daily function.
Material & Methods: A prospective cohort of 226 patients with Dupuytren's disease who underwent selective fasciectomy was evaluated. Quality of life measures were assessed pre-operatively and three months post-operatively using EQ5D-3L, QuickDASH, PRHWE, and NRS pain scale tools to capture changes in pain, physical function, self-care, and overall well-being. Correlation and regression analyses were applied to examine relationships between surgical outcomes and key quality of life indicators.
Results: Analysis revealed a statistically significant, though clinically modest, decline in quality of life three months following surgery. The average EQ-5D score for Dupuytren's patients decreased from 0.95 pre-operatively to 0.93 post-operatively. In comparison, conditions with similar EQ-5D scores include arthritis (0.94), and mild cases of carpal tunnel syndrome (0.87), both of which, like Dupuytren's, impact hand function and can restrict daily activities without severely impairing overall quality of life. Wrist fractures, scored at approximately 0.88 twelve months post-injury, demonstrate similar recoverable functional impacts. Conversely, diseases like chronic non-neuropathic pain, with scores of 0.93, show minimal overall impairment but align with the limited impact Dupuytren's has on broader quality of life dimensions.
These findings suggest that while Dupuytren's disease and selective fasciectomy may result in some decline in quality of life on the short term, the impact is comparable to other upper-limb musculoskeletal and soft tissue conditions, which often allow for adaptation and manageable long-term outcomes. It is also important to note that this modest decline

in quality of life may reflect the relatively short three-month follow-up period, as longer-term recovery could reveal different outcomes.
Conclusions: While selective fasciectomy yields physical benefits, its impact on quality of life appears modest within the first three months, with limited functional improvement and pain reduction. The findings suggest that Dupuytren's disease, while impactful on hand function, may not reduce quality of life as significantly as more debilitating conditions. This highlights the importance of setting realistic patient expectations for functional gains and underscores the need for longer-term quality of life assessments to capture the full extent of post-surgical outcomes, incorporating psychological and socio-economic dimensions as well.

A-0382 THE PERIPHERAL "NERVE LOOP": END-TO-END AND END-TO-SIDE NEURORRHAPHY AS SURGICAL TREATMENT OF PAINFUL NEUROMAS IN PERIPHERAL NERVES

Michael Kohlhauser[1], Christian Smolle[1], Magdalena Holter[2], Georg Riegler[3], Werner Girsch[1]
[1]Devision of Plastic, Aesthetic and Reconstructive Surgery, Department of Surgery, Medical University Graz, Graz, Austria; [2]Medical Informatics, Statistics and Documentation, Medical University Graz, Graz, Austria; [3]Private Ultrasound Center, Graz, Austria

Introduction: Various methods have been described in the literature for the treatment of painful neuromas in peripheral nerves, which are often not sufficiently effective. Currently, if reconstruction of the affected nerve is not possible, the most popular method is the intramuscular transposition of the nerve stump after neuroma resection. An as-yet insufficiently tested approach consists of resection of the neuroma with subsequent neurorrhaphy of the proximal nerve end to a neighbouring nerve branch, using an end-to-side or end-to-end technique. This method results in the formation of a peripheral "nerve loop" and may prevent the development of a new painful neuroma.
Aim: The objective is to evaluate pain reduction following this approach and compare outcomes to standard methods.
Methods: A retrospective analysis of patients who underwent surgery due to chronic neuropathic pain caused by peripheral nerve neuromas with numeric rating scale (NRS) ≥ 6 between January 1, 2018 and March 31, 2024 was performed. Patients who underwent neuroma resection with subsequent end-to-side or end-to-end neurorrhaphy are considered the study group, while those who were treated with another technique, including intramuscular, intravenous, intraosseous or subcutaneous transposition of the proximal nerve stump after neuroma resection, acts as control. The pain, according to NRS, at least 1-year post surgery, and other important patient data, including affected nerve/s, neuroma origin, pre-treatment and other relevant data, are collected.
Results: So far, data from a total of 33 patients have been analyzed, including 16 patients treated with either end-to-end or end-to-side neurorrhaphy, while 17 received a transposition of the proximal nerve stump. The study group consists of 44% women and 56% men with an average age of 51.19 (29-78) years, while the control group comprises 35% women and 65% men with an average age of 44.65 (20-62) years. In the study group, the nerves of the upper and lower extremities were affected in equal proportions of 50%. Concurrently, in the control group, the upper extremity was affected in 53% of cases, and the lower extremity was affected in 47%. The control group exhibited a mean value on the NRS of 7.71 (6-10), whereas the study group presented a mean of 8.19. Post-surgery, the NRS mean values declined to 5.29 (0-8) after on average 49.0 months in the control group and 2.38 (0-9) after on average 32.1 months in the study group. Consequently, the mean NRS in the study group decreased significantly by 5.81, whereas the control group showed a reduction of only 2.41 ($P < 0{,}001$).
The subgroup analysis revealed significant improvements in patients treated with end-to-end neurorrhaphy ($n = 14$), with a mean NRS reduction from 8.07 to 2.14, compared to patients treated with intramuscular nerve stump transposition

(n = 10), whose mean decreased from 7.6 to 4.9 (P <0,001).
Conclusions: Despite the small sample size, the formation of a peripheral "nerve loop" via end-to-end or end-to-side neurorrhaphy, mandatorily embedded in a multimodal treatment concept, appears to be an effective treatment option for patients suffering from chronic neuropathic pain due to traumatic neuromas of peripheral nerves.

A-0383 VOLAR TRANSLATION OF THE FIRST METACARPOPHALANGEAL JOINT ON THE LATERAL RADIOGRAPHY: A RELIABLE DIAGNOSTIC SIGN FOR THE SKIER'S THUMB

Julian Hasler, Dimitris Dimitriou, Andreas Flury, Sebastian Guenkel
City Hospital Zürich, Switzerland

Introduction: A complete rupture of the ulnar collateral ligament (UCL) of the thumb leads to instability of the first metacarpophalangeal joint (MCPJ-I) with resulting rotatory subluxation and volar translation of the joint.
Aim: The aim of this study was to investigate the validity and reliability of this translation in identifying a complete UCL rupture on a plain lateral radiography.
Material & Methods: Retrospective case series including 35 patients with a complete UCL rupture (diagnoses with ultrasonography). Lateral thumb radiographs of 35 patients with a complete UCL rupture and 70 healthy control subjects were retrospectively reviewed.
Results: The average volar translation of the proximal phalanx in the MCPJ-I was 3.7 ± 1.4 mm (28.7% ±10%) and 1.2 ± 0.9 mm (9.5 ± 6%) in the UCL-ruptured and the control group respectively. A volar translation of >2.7 mm (or more than 18% of the height from the base of the proximal phalanx) demonstrated a sensitivity of 83.3%, a specificity of 98.5 %, a negative predictive value of 92.4%, a positive predictive value of 96.7%, and an accuracy of 93.7% in identifying a complete UCL rupture.
Conclusions: When the anamnesis is suspicious for a skiier's thumb injury and in the plain lateral radiography there is a subluxation of almost 4 mm or almost 20% of the height of the proximal phalangeal base is evident, there is a high chance of a complete rupture of the ulnar collateral ligament of the thumb MCP joint.

A-0384 RADIOCARPAL ARTHRODESIS USING A LOCKING DISTAL FIBULA PLATE: TECHNIQUE AND CLINICAL OUTCOMES IN A SERIES OF 37 PATIENTS

Faisal Adi, Paul Chanzy, Alain Sautet, Adeline Cambon
Sorbonne University, Orthopaedic and trauma surgery department, Saint-Antoine Hospital, Paris, France

Introduction: Total wrist arthrodesis is a surgical procedure designed to alleviate pain and stabilize the wrist in patients with severe pancarpal arthropathy. It can also enhance hand function and appearance in patients with neurological sequelae, such as paralysis or spasticity. Currently, dedicated dorsal plates are the primary method of fixation; however, their bulkiness is a significant drawback, particularly in patients with severe neurological or rheumatological conditions. Our hypothesis was that anatomically designed distal fibula locking plates could be a promising alternative due to their thin profile, pre-contoured dorsal curvature, and screws sized 2.8 mm distally and 3.5 mm proximally.
Aim: This study aimed to evaluate the outcomes of radiocarpal arthrodesis fixation using distal fibula locking plates in a clinical series of total wrist arthrodesis cases.
Material & Methods: This retrospective study included patients who underwent radiocarpal arthrodesis with a locking distal fibula plate between 2016 and 2024. The surgical approach systematically passed through the 3rd extensor compartment

while fully preserving the 4th compartment. Patient demographics, surgical indications, postoperative outcomes, and complications were collected and analyzed from medical records or through independent telephone interviews when patients could be reached.
Results: The series included 37 patients with a mean age of 47 years (range: 21–87 years). Locking distal fibula plates were straight in 27 cases and racket-shaped in 10 cases. The primary indications were spastic hemiplegia (14 cases) and post-traumatic sequelae (10 cases). Among the 37 patients, 25 were successfully contacted by phone, 9 had their most recent follow-up consultation used for analysis, and 3 patients had died. The average follow-up duration was 29 months (range: 6–96 months). Consolidation was achieved in all patients within 3 months. In the 25 patients contacted, the average satisfaction score was 7.4 out of 10. In response to the question, "Would you undergo the procedure again?", 22 patients answered yes, 2 no, and 1 was unsure. Twenty-one patients reported functional and/or aesthetic improvements, while 4 reported no improvement following surgery. Regarding pain, the average preoperative visual analogue scale (VAS) score dropped from 7 to 4.4 postoperatively. Complications included 3 cases of surgical site infections that occurred after consolidation and 2 instances of implant prominence under the skin in very thin patients, leading to 5 plate removals. No extensor tendon adhesions were observed.
Conclusions: The use of locking distal fibula plates for radiocarpal arthrodesis provides satisfactory clinical outcomes with a low complication rate. This approach appears to be a simple and effective option for total wrist arthrodesis fixation as it is readily available in many orthopedic operating theatres.

A-0385 HARVEST OF A FASCICLE OF ULNAR NERVE FROM POSTERIOR APPROACH AS A DONOR NERVE IN UPPER BRACHIAL PLEXUS INJURIES

Reza Sh. Kamrani
Tehran University of Medical Sciences, Tehran, Iran

Introduction: in spite of its long story of nerve transfer, this procedure changed the strategy of the treatment of traumatic brachial plexus injuries (BPI) dramatically after Oberlin procedure in 1994. Then after a lot of nerve transfers has been presented. In upper BPI, Ulnar nerve is a common donor nerve for nerve transfer, but all of these transfers has been described through anterior approach. We reviewed our patients with BPI treated by nerve transfer from ulnar nerve via posterior approach and their results.
Aim: Results of nerve transfer from ulnar nerve to triceps branch or axillary nerve from posterior approach.
Material & Methods: from March 2018 to February 2023 we had 12 patients with upper brachial plexus injuries treated with nerve transfer including nerve transfer from ulnar nerve from posterior approach. With semi-lateral position and posterior longitudinal approach ulnar nerve was explores just medial to radial nerve at the beginning of their course between long head and lateral head of triceps. A fascicle of ulnar nerve was chosen and transferred to a branch of triceps or axillary nerve. The final MRC scale of the recipient muscle evaluated after at least 18 months after surgery.
Results: We evaluated the results of 10 of our patients with more than 18 months follow up. 6 patients had transfer to triceps branch and 4 patients to axillary nerve. The final MRC scales of the recipient muscle reached to four in two patients, three in six patients and zero in two patients.
Conclusions: In Upper brachial plexus injury ulnar nerve is a main donor nerve for nerve transfer. The recipient of this nerve is usually elbow flexors. In C5C6C7 injuries elbow Triceps brachii and deltoid reanimation needs some sources. With a good median nerve for reanimation of elbow flexors, we can keep the ulnar nerve for other muscles. Ulnar nerve exploration from posterior approach is very simple and gave us an easy access to triceps branches and axillary nerve and

makes it easy to transfer of a fascicle of ulnar nerve to triceps branches or axillary nerve. We suggest these transfers for extended upper BPI.

A-0386 THE TALE OF THE HIDDEN CIRCLE

Anuhya Vusirikala[1], Sara Ahmad[1], Saeef Haque[1], Sarah Mahmoud[2], Shakir, Hussain[1], Mudussar Ahmad[1]
[1]Queen's Hospital Romford, UK; [2]Anglia Ruskin University, London, UK

Background: Embedded ring syndrome is a condition in which rings become trapped due to swelling of the digit secondary to trauma, obesity, or lymphoedema. This can result in pain, further swelling, and potential neurovascular compromise. Surgical intervention is often required when conservative measures, such as lubrication or traditional ring cutters, become ineffective or unsafe due to severe tissue embedding. This case report explores the diagnostic and therapeutic approach for managing embedded ring syndrome in a patient with significant comorbidities.
Case Presentation: A 51-year-old woman with a history of morbid obesity, hypertension, chronic lymphoedema, and a recent middle cerebral artery stroke presented with nearly fully embedded rings on the left ring finger and right middle finger. She had worn the rings continuously for over 20 years. On examination, the rings were completely embedded within the soft tissues at the base of the proximal phalanx, with only the dorsal aspect visible. Although she had discomfort and pain, her fingers had a full range of motion with no neurovascular compromise. All non-surgical attempts to remove the rings, including cutting the visible portion of the ring on the right middle finger, were unsuccessful. Due to a partially cut ring on the left, associated pain, elevated risk of infection, and potential for ischemic complications, removal of the rings under general anaesthesia was deemed necessary. A tourniquet was not available for use due to her high body mass index. On the right middle finger, a near circumferential skin incision was made to expose and remove the ring, followed by careful haemostasis and closure using 3/0 Nylon sutures. On the left hand, three embedded rings on the ring finger were sectioned with a wire cutter and removed with minimal skin incision.
Clinical Outcomes: Postoperatively, the patient achieved significant pain relief and successful wound healing without flexor tendon injuries or neurovascular compromise.
Discussion: Embedded ring syndrome is rare. This case highlights the importance of a multidisciplinary approach in managing embedded ring syndrome in patients with complex medical histories. Advanced imaging, such as MRI, can support surgical planning in challenging cases, helping surgeons anticipate potential complications. Through customised surgical techniques, effective removal of embedded rings was achieved while preserving neurovascular integrity, ultimately improving patient comfort and minimising the risk of further complications. This case underscores the importance of tailored care strategies for optimal outcomes in high-risk populations.

A-0387 REGIONAL VARIATIONS IN SURGERIES FOR CARPAL TUNNEL SYNDROME, CUBITAL TUNNEL AND GUYON'S CANAL SYNDROME: A REGISTRY-BASED STUDY IN FINLAND

Vieda Lusa[1,2,3], Ville Ponkilainen[3], Anniina Laurema[4], Ville Mattila[3,5,6], Teemu Karjalainen[1,3]
[1]Hospital Nova of Central Finland, Jyväskylä, Finland; [2]University of Jyväskylä, Jyväskylä, Finland; [3]Tampere University Hospital, Tampere, Finland; [4]Mikkeli Central Hospital, Mikkeli, Finland; [5]COXA Hospital for Joint Replacement, Tampere, Finland; [6]University of Tampere, Tampere, Finland

Introduction: When clinical decisions are guided by standardized guidelines and high-quality evidence, rates of surgery for similar conditions are expected to be consistent across regions.

Aim: This study aimed to assess the variation in the incidence rates of surgeries for carpal tunnel syndrome, cubital tunnel syndrome, and Guyon's canal syndrome across hospital districts in Finland from 2010 to 2021 to assess regional consistency.
Material & Methods: We extracted data from Finland's Care Register for Health Care on surgery incidence rates for carpal tunnel syndrome, cubital tunnel syndrome, and Guyon's canal syndrome from 2010 to 2021. The study included all 21 hospital districts in Finland. We calculated age-adjusted incidence rates (new cases per 100,000 person-years), 95% confidence intervals (CIs), and incidence rate ratios calculated relative to population size as reported by Statistics Finland.
Results: In the three-year period from 2018 to 2021, incidence rates for both carpal tunnel and ulnar-related surgeries varied across hospital districts:
1) With carpal tunnel release, the average incidence rate was 219 cases per 100,000 person-years. The lowest rate occurred in Åland at 102 cases per 100,000 person-years (95% CI 82.6–124), half the national average. The highest rates were 1.5 to 1.8 times the national average and up to four times higher than lowest, found in South Ostrobothnia with 393 cases (95% CI 377–409), North Karelia with 356 cases (95% CI 340–372), and South Savo with 320 cases (95% CI 301–340) per 100,000 person-years. Comparing the 2018–2021 carpal tunnel release rates to those from 2010–2013 showed that the incidence changed in many regions, change ranging from a 37% decrease in Kymenlaakso to a 126% increase in South Savo, with Central Ostrobothnia showing a 63% increase. Overall, 9 districts saw a decrease in incidence, while 12 districts experienced an increase.
2) With ulnar release, the average incidence rate was 23 cases per 100,000 person-years, and regional variation was even larger than in carpal tunnel release. The incidence ranged from 3 cases per 100,000 person-years (95% CI 1–9) in Åland to 83 cases per 100,000 person-years (95% CI 74–93) in Lapland, which had an incidence rate 3.6 times the national average. A comparison of 2018–2021 rates to 2010–2013 rates showed wide variability, from a 43% decrease in Kymenlaakso to a 205% increase in North Savo. Other notable increases occurred in Lapland (169%), Central Ostrobothnia (136%), and North Karelia (122%).
Conclusions: Surgically treated cases for carpal tunnel syndrome show up to a fourfold variation across Finland's hospital districts. Although less common in absolute numbers, surgical treatment rates for cubital tunnel and Guyon's canal syndromes vary up to 28-fold among these regions. Such large variations cannot be explained by differences in population morbidity. Instead, these findings suggest that the indications for these surgeries vary widely, pointing to a lack of high-quality evidence regarding which patients benefit most.

A-0388 OUTCOMES OF THUMB REPLANTATION: A RETROSPECTIVE ANALYSIS OF 19 CASES

Maja Smorąg, Jędrzej Króliński, Piotr Węgrzyn, Szymon Manasterski, Michał Chęciński, Paweł Stajniak, Marta Jagosz, Marcin Syrko, Ahmed Elsaftawy
St. Jadwiga Śląska Hospital in Trzebnica, Poland

Introduction: Thumb replantation remains a critical procedure in hand surgery due to the thumb's significant role in hand function.
Aim: This study examines clinical outcomes following thumb replantation in patients with varying levels of amputation, aiming to identify factors influencing replantation success and failure.
Material & Methods: This retrospective analysis included 19 patients who underwent thumb replantation, with a predominant male demographic (18 males, 1 female) and an average age of 41 years. Amputation levels were categorized as follows:

- Above the interphalangeal (IP) joint: 7 cases

- Below the IP joint: 9 cases
- Below the metacarpophalangeal (MP) joint: 3 cases

Results: Successful replantation was achieved in 16 of 19 patients, with a failure rate observed in 3 cases. Failure distribution by amputation level included:

- Above IP joint: 2 failed cases
- Below IP joint: 1 failed case

The overall replantation success rate was 84.2%. Notable challenges in achieving positive outcomes were associated with amputation levels and the vascular complexity of each case.

Conclusions: Thumb replantation can offer satisfactory functional recovery with an 84.2% success rate in this series. However, outcomes are influenced by the level of amputation, with proximal amputations posing greater risks for failure. These findings underscore the importance of precise surgical planning and consideration of amputation level to enhance replantation success.

A-0389 TRANSLATION, CROSS-CULTURAL ADAPTATION AND VALIDATION OF RUSSIAN VERSION OF PATIENT-RATED WRIST EVALUATION (PRWE-RUS)

Igor Golubev[1], Niyaz Latypov[2], Gleb Yurasov[1], Georgiy Nazaryan[3], Andrey Panteleev[4]

[1]National Medical Research Center of Traumatology and Orthopedics named after N.N. Priorov, Moscow, Russia; [2]'Private Clinic Almaty', Almaty, Kazakhstan; [3]State Clinical Hospital named after A.K. Eramishantseva, Moscow, Russia; [4]Russian Children's Clinical Hospital, Moscow, Russia

Introduction: The Patient Rated Wrist Evaluation (PRWE) is a questionnaire specifically designed to assess wrist joint function and pain. The PRWE questionnaire has been translated and adapted into many languages and is used to evaluate the effectiveness of treatments for various wrist joint pathologies.

Aim: To translate and cross-culturally adapt the PRWE for use in a Russian-speaking patient population.

Material & Methods: The original Canadian version was first translated into Russian by two translators fluent in the Russian language. The translators then compared their translations and resolved any discrepancies through consensus. The process was overseen by the senior author, who also participated in the discussions. A preliminary Russian version of the PRWE questionnaire was created. Next, two professional translators, whose native language is English, independently performed a back-translation. An expert panel, fluent in both Russian and English, was then convened to review the translations. After discussing the differences between the versions, the test version of the questionnaire was finalised through consensus. This version was subsequently tested on 15 healthy healthcare workers and 16 patients with various orthopaedic pathologies. After analysing the feedback, the final version of the questionnaire was developed and assessed for validity, reliability, and responsiveness.

Results: The adapted Russian version of the questionnaire, PRWE-rus, was obtained and demonstrated good validity, reliability, and responsiveness.

Conclusions: The PRWE-rus is a translated and adapted Russian version of the PRWE questionnaire, successfully validated for use in a Russian-speaking population.

A-0391 EXPERIENCE IN THE USE OF REVERSE VASCULARIZED NERVE GRAFTS FOR THE HAND APPLIED TO THE LEG

Martins Kapickis, Iveta Beinarovica
Microsurgery Centre of Latvia

Introduction: There are certain conditions in peripheral nerve surgery when "gold standard" reconstruction techniques are not rational to apply due to extensive gap of the damaged segment of the nerve or poor soft tissue bed. The only way to address the extensive length of the nerve defect is by using a vascularized nerve graft, which is proven to be superior to a standard cable graft. Reverse vascularized ulnar nerve grafts, based on a perforator from the brachial artery, were first utilized in cross-C7 transfers for brachial plexus reconstruction. Since the start of the Russo-Ukrainian war, we have encountered a number of extensive shrapnel injuries of the Sciatic nerve. Before the war, our Centre had limited experience with extensive lower limb nerve injuries, mainly due to a low case load compared to brachial plexus injuries. We present a few Ukrainian army servicemen to highlight the severity of traumas rarely seen in peacetime and the use of vascularized perforator-based reverse nerve grafts.
Material & Methods: We present 3 cases concerned to Ukrainian army servicemen who required nerves reconstruction after shrapnel injuries in the battlefield.
Results: The initial case presented involved a 23-year-old male who sustained shrapnel injuries affecting the Ulnar, Radial, and Median nerves, as well as the Brachial artery in the right arm. A surgical procedure was conducted utilizing a reverse vascularized Ulnar nerve graft to reconstruct the Median nerve, thereby restoring sensation. The second case pertained to a 41-year-old male with a defect in the Ulnar nerve located in the left forearm. In this instance, the sensory branch of the Ulnar nerve was used as a reversed vascularized graft, which was directly sutured to the Ulnar motor branch to enhance the potential for motor regeneration. This surgical principle was similarly applied to address extensive nerve defects in the lower limb. In the third case, a 39-year-old male presented with a significant defect in the Sciatic nerve of the right thigh. A reversed vascularized superficial Peroneal nerve graft was employed, and it was sutured to the Sciatic nerve proximally and the Tibial nerve distally, given the importance of the sensory component of the Tibial nerve.
Conclusions: Reverse vascularized nerve grafts represent a promising alternative for nerve reconstruction. This technique is regarded as technically superior to vascularized free nerve grafts, particularly in addressing challenges associated with poor soft tissue beds and accompanying vascular injuries. The primary aim of such nerve reconstruction is to promote direct reinnervation to a nerve that demonstrates enhanced functional capacity in specific contexts. However, due to the limited number of cases available for analysis, further research is necessary to validate the functional advantages of this approach.

A-0394 PREDICTIVE MODEL FOR SURGICAL SUCCESS IN PATIENTS WITH CARPAL TUNNEL SYNDROME USING NATURAL LANGUAGE PROCESSING

Ignacio Esteban Feliu, Alex Lluch Bergada, Jordi Pedemonte Jansana, Núria VIdal Tarrasón, Raquel Sevil Mayayo, Irene Gallardo Calero
Department of Orthopedics, Vall Hebron University Hospital, Spain

Introduction: Carpal tunnel syndrome (CTS) is a common condition requiring surgery when symptoms persist despite conservative management.
Aim: We aimed to develop a predictive model for surgical success in patients undergoing surgical intervention for CTS using natural language processing (NLP) of electronic health records (EHRs).
Material & Methods: This retrospective observational monocentric study analyzed data from patients aged ≥18 years

who underwent CTS surgery between January 2015 and January 2021, with at least one year of postoperative follow-up. NLP was applied to unstructured clinical notes to extract variables related to comorbidities, symptoms, treatments, and outcomes. Five machine learning models were developed to predict surgical success, namely logistic regression (LR), Random Forest (RF), Decision Tree (DT), Light Gradient Boosting Machine (LightGBM) and Extreme Gradient Boosting (XGBoost). Models were evaluated by sensitivity, specificity, precision, area under the receiver operating characteristic curve (AUC ROC), and F1-score.

Results: Among 569 patients assessed (median age 60.5 years; 73.8% female), surgical success was achieved in 90.9%. Common comorbidities included hypertension (23.9%) and diabetes mellitus (14.2%). Logistic regression demonstrated the best predictive performance (AUC ROC = 0.604), identifying significant predictors of surgical failure such as neuropathy (odds ratio [OR] = 3.20), non-smoking status (OR = 2.92), prior paracetamol use (OR = 2.49), neurology consultations (OR = 2.19), positive Tinel's sign, absence of preoperative pain, and presence of paresthesia. RF, DT, LightGBM, and XGBoost classifiers demonstrated lower AUC ROC values ranging from 0.57 to 0.59.

Conclusions: NLP effectively extracted clinically relevant information from unstructured EHR data. While the predictive models showed moderate performance, key predictors of surgical outcomes were identified, potentially aiding clinical decision-making in CTS management.

A-0395 PROPELLER FLAPS IN UPPER LIMB RECONSTRUCTION

Ahmed Farghaly[1], Ahmed Gamal Nouh[2], Mohamed Abdel- Wahed[1], Ashraf Moharram[1], Yaser El Safoury[1], Mostafa Ezzat[1]
[1]Cairo university Hospitals Cairo Egypt; [2]Helwan university Hospitals Cairo Egypt

Propeller perforator flaps provide a reliable and effective solution for reconstructing upper limb defects, offering both functional and cosmetic benefits. Utilizing local or regional flaps has emerged as a preferred approach due to advantages such as shorter operation time, the use of tissue similar to the defect site, and the avoidance of complex microsurgical techniques.

Aim: This study aims to evaluate the reliability of propeller perforator flaps in reconstructing upper limb soft tissue defects.

Materials & Methods: In this uncontrolled case series, 36 cases of upper limb defects were reconstructed using propeller perforator flaps between November 2008 and June 2013. All flaps were performed by a single surgeon and were applied to various sites and indications across the upper extremity. Patient demographics, surgical indications, defect characteristics, complications, and clinical outcomes were assessed.

Results: Propeller perforator flaps were found to be a reliable reconstructive option, with the largest flap measuring 40 cm^2. No complete flap loss was recorded. Primary closure of the donor site was possible in 24 cases, while split-thickness skin grafting was required in 12 cases. Stable coverage was achieved in all 36 cases, with 26 flaps healing without complications. Minor complications, including partial flap loss and congestion, occurred in 10 cases (27%). Six cases experienced partial distal flap loss; four healed by secondary intention, and two required debridement and secondary suturing. Two cases presented with postoperative congestion; one was resolved through re-exploration of the perforator to correct a kink, while the other was managed conservatively.

Conclusion: Propeller perforator flaps are a dependable choice for small to moderate upper limb defects. Their flexibility provides straightforward options for complex reconstructions, yielding reliable outcomes and aesthetically acceptable results, especially when donor sites are closed primarily. Successful outcomes depend on careful patient selection, atraumatic handling of perforators, complete isolation to minimize torsion, and strict hemostasis during harvest. Propeller perforator flaps can be considered a first-line option for selected patients in upper limb reconstruction.

A-0396 REVISION TO ARTHRODESIS AFTER FAILED TRAPEZIOMETACARPAL TOTAL JOINT REPLACEMENT, A SOLUTION FOR SELECTED PATIENTS

Rasmus D Thorkildsen[1], May Tove Hestmo[1], Trygve Holm Glad[1], Magne Røkkum[1,2]
[1]Division of Orthopaedic Surgery, Oslo University Hospital, Norway; [2]Institute of Clinical Medicine, Oslo University, Norway

Introduction: Total joint replacements are increasingly used for the treatment of symptomatic trapeziometacarpal arthritis. Survivorship has improved, but surgeons will continue to be faced with failing implants. Various solutions have been suggested including revision to a new implant (usually just the cup), and trapeziectomy. The literature is scarce but would seem to favor the latter

Aim: We have found results after secondary trapeziectomy (leaving the stem in place) unpredictable and present an alternative involving a trapeziometacarpal arthrodesis with an intercalated iliac crest bone graft with results from the first four cases

Material & Methods: A retrospective case series of three male and one female patient, median age 59,6 (57-72). The reason for revision was suspected infection in two cases (both with negative bacteriology, and both treated as two-stage revisions), early failure of the PE liner in one case and unexplained, persistent pain in the last. All surgeries were performed under general anesthetic harvesting a 4-5cm long cortico- cancellous iliac crest graft from the ipsilateral side (two left thumbs). The cup was gently chiseled out maintaining the integrity of the trapezium. The stem was removed with a dorsal bone lid in the first three cases, in the last case it was possible to loosen it with circumferential drilling with a k-wire and a small chisel. The graft was first secured snugly into the metacarpal (also reestablishing the dorsal cortex in the first three cases). Thereafter shaping of the proximal end of the graft into a spherical shape was performed , pressing it firmly into the void after the cup. K-wire fixation and further packing with cancellous bone was then performed and a plaster cast was worn for eight weeks, after which k-wires were removed. Patients were followed up and assessed with x-rays, quick DASH, grip- and key pinch strength and range of opposition

Results: All four arthrodesis have healed, the last patient is still waiting on final follow up, but has returned to work as an industrial mechanic. The remaining three patients are very satisfied with their fused thumb and the function it provides, with low Quick Dash scores (6.8, 9.1 and 6.8) and all three have regained strong pinch relative to the healthy side (80-90%) with a follow up of 6-12 months Grip strength varied more (60-130%). We experienced two complications (both in the same patient); a minimally displaced fracture of the anterior iliac spine on the side of graft harvest (treated conservatively, healed uneventfully) and paraesthesias in the median nerve distribution due to one of the pins passing though the trapezium being too long. It required removal after inspection of the nerve through a carpal tunnel release, the nerve was undamaged and symptoms quickly abated.

Conclusions: It is a more technically demanding and time consuming procedure than trapeziectomy, but once healed, it preserves thumb length and strength. Thus, we offer it primarily to patients with high demanding work. Another situation where we would consider using it, is if the contralateral thumb already has undergone an unsuccessful and persistently painful trapeziectomy.

A-0398 FUNCTIONAL AND RADIOLOGICAL OUTCOMES OF DISTAL ULNA FRACTURES: EVALUATING CONSERVATIVE AND SURGICAL APPROACHES

Ahmed Gamal Nouh[2], Mohamed Talaat Elhendy[3], Ahmed Farghaly[1], Mohamed Abdel-Wahed[1]
Cairo University, Cairo, Egypt; [1]Helwan University, Cairo, Egypt; [2]Bank Al-Ahly Hospital, Cairo, Egypt; (3)

Introduction: Distal ulna fractures, though less common than distal radius fractures, are crucial for wrist function and forearm stability. Treatment strategies for these fractures, especially the choice between conservative and surgical approaches, remain debated. This prospective study evaluates clinical and radiological outcomes of conservative versus surgical management of distal ulna fractures to guide optimal treatment strategies.
Aim: To assess and compare the functional and radiological outcomes of conservative and surgical treatments for distal ulna fractures in a cohort of 60 patients treated at a level 1 trauma center between June 2019 and June 2023.
Material & Methods: This prospective study included 60 patients with distal ulna fractures (excluding styloid fractures), classified using the AO/OTA system. Patients were treated with either conservative management (n=36) or surgical intervention (n=24), the latter involving internal fixation with plates and screws. Outcomes were evaluated for radiological union, functional recovery, and complications at 6 and 12 months, using the Patient-Rated Wrist Evaluation (PRWE), Mayo Wrist Score (MWS), range of motion, and grip strength.
Results: Of the 60 fractures, conservative treatment was applied to 60% of cases, achieving a 78% success rate for non-displaced fractures. Surgical intervention yielded a 92% union rate, with volar plating used in 75% of cases and external fixation in 25%. Complications were observed in 5% of surgical cases, including three non-unions (10%) and one hardware failure. Average union time was 12.7 weeks (range, 8–24 weeks). Functional recovery showed an 89% grip strength restoration compared to the contralateral side. PRWE scores were significantly improved in non-displaced fractures ($p < 0.05$). Mayo scores indicated excellent results in 69.5% of cases, good in 16.7%, fair in 10%, and poor in 3.3%.
Conclusions: Conservative management is effective for stable, non-displaced distal ulna fractures, whereas surgical intervention, particularly with internal fixation, enhances outcomes in complex or displaced fractures. The findings support individualized treatment approaches based on fracture stability and displacement.

A-0399 CAN A THUMB INTERPHALANGEAL JOINT MOVE AFTER FLEXOR POLLICIS LONGUS CLOSED RUPTURE?

Eleni Karagergou, Dimitrios Rigkos, Menelaos Mountzouris, Alexandros Konstantinopoulos, Paschalia Athanasiadou, Panagiotis Givissis
AUTH Hand Unit, 1st Orthopaedic Department, Aristotle University of Thessaloniki, G. Papanikolaou Hospital, Greece

Introduction: Primary tendon repair is the optimal treatment for acute traumatic injuries of flexor tendons. However, tendon transfer or tendon grafting are indicated in delayed or chronic cases. In such cases, a pseudotendon that bridges the gap between the proximal and distal tendon stumps may form, and it represents a biologic attempt at reconstitution of the continuity of the tendon.
Aim: The aim of this study is to highlight the diagnostic challenge that may arise from the presence of a pseudotendon, producing a false movement that could potentially confuse the clinician.
Material & Methods: A 69-year-old male patient presented with pain and limited movement in his left thumb, following a 3-month-old closed hyperextension thumb injury. On clinical examination, there was tenderness over the A1 pulley of his thumb and 0 to 20 deegres of active range of movement (AROM) of the interphalangeal joint (IPJ). Plain radiographs were normal, but ultrasound revealed a linear structure within the flexor tendon sheath with loss of normal fibrillar

reflectivity and decreased excursion on passive flexion, which was consistent with rupture of the flexor pollicis longus (FPL) tendon and pseudotendon formation. Surgical exploration was decided, and a 7 cm long and well-formed, rounded pseudotendon was identified and excised, preserving part of the A2 pulley. The tendon gap was reconstructed with a free autograft harvested from the proximal tendon stump.
Results: The patient had an uneventful recovery period, and early active motion therapy commenced, protected by a dorsal splint. Histopathology confirmed the different consistency of the specimen, which was consistent with pseudotendon rather than normal tendon. In 6 months of follow-up, the patient had nearly normal IPJ motion (0 to 70 degrees of AROM) and a satisfactory recovery of pinch and grip strength
Conclusions: A pseudotendon lacks the tensile strength of a normal tendon, and failure to recognize it can lead to clinical misjudgment of a true tendon rupture. In our case, the pseudotendon was painful but well-formed and allowed limited but not functional flexion of the IPJ. Awareness of its characteristics can guide the preoperative investigations, which play a critical role in diagnosis.

A-0400 TREATMENT STRATEGY AND RESULTS OF SEYMOUR FRACTURES OF THE DISTAL PHALANX

Elvira Mateos-Álvarez, Belén García-Medrano, David Noriega-González
Clinical University Hospital, Valladolid, Spain

Introduction: Seymour fractures are epiphyseal, open, displaced fractures of the distal phalanx accompanied by a laceration of the overlying nail bed that intervenes at the fracture site and prevents reduction. Fortunately, these injuries are rare, with potentially devastating consequences of inadequate diagnosis or treatment. The proximity of the growth plate means that these fractures can lead to soft tissue infections or osteomyelitis, and secondarily lead to growth arrest or nail or finger deformities. Although there is currently no consensus on the optimal treatment of these fractures, the most standardised approach is extensive debridement followed by percutaneous needle fixation as described below. Evaluation and treatment by a surgeon experienced in hand pathology is recommended.
Aim: The aim of our paper is to describe the management and evaluate the outcome of a patient with a Seymour fracture to emphasise early diagnosis to minimise complications and morbidity.
Material & Methods: We present the case of an 8 year old patient diagnosed late with a Seymour fracture with inadequate initial management. Physical examination revealed a hammerhead deformity. X-rays showed a displaced fracture of the distal phalanx with involvement of the physis. The patient required surgery in which the nail matrix interposed in the fracture site was removed. Profuse lavage with copious amounts of physiological saline and thorough debridement was performed across the nail bed lesion. Under scopic control, reduction and osteosynthesis was performed with two 0.9 mm K-wires retrograde to the base of the distal phalanx. The nail bed was repaired, and the nail was reinserted into the eponychial plate, serving as a splint and protecting the synthesis.
Results: Initially the patient is immobilised with a splint for 5 weeks. During the first week the patient receives antibiotic treatment with Amoxicillin-Clavulanic acid. After the immobilisation is removed, rehabilitation is started, aimed at achieving full mobility and functionality of the finger. Our patient achieved clinical and radiological consolidation without deformity or development of infection. He has full mobility and carries out school and sporting activities appropriate to his age without perceiving any limitations
Conclusions: Seymour fractures are rare injuries that occur in skeletally immature individuals. Their innocuous appearance explains why they go unnoticed in a high percentage of patients. Their complexity is due to the associated soft tissue component and the potential risk of infection, which will determine the prognosis. Early assessment and treatment is

the most effective strategy to minimise the risk of complications. Although there is no standardised protocol, what has shown the best results is thorough lavage, thorough debridement, antibiotic therapy and osteosynthesis with Kirschner wires after removal of the nail bed interposed in the physis.

A-0402 INVETERATE INJURIES OF THE RADIAL COLLATERAL LIGAMENT OF THE THUMB

Elvira Mateos-Álvarez, Belén García-Medrano, David Noriega-González
Clinical University Hospital, Valladolid, Spain

Introduction: Injuries to the radial collateral ligament (RCL) of the metacarpo-phalangeal (MCF) joint of the thumb are rare and usually occur from trauma in which the finger is forced into excessive abduction. These injuries can lead to joint instability, chronic pain and loss of strength or function if not treated in time.
Aim: The aim of this case is to present an effective surgical approach to the treatment of a chronic CSF injury of the MCF joint of the thumb, highlighting the importance of ligament repair and postoperative rehabilitation in full functional recovery.
Material & Methods: We present the case of a 59-year-old male patient who came for consultation one month after suffering enthesis of the right thumb after his thumb got caught in a rotating machine. On physical examination, the patient presented with an oedematous thumb, with pain on palpation of the CSF and significant yawning with radial deviation of the thumb in stress manoeuvres, indicating joint instability. Initial radiographs were ordered and showed subluxation of the MCF joint. The study was completed with an MRI, which confirmed the injury and also showed a chondral lesion in the metacarpal head of the thumb consistent with the time of evolution.
Given the instability, the time of evolution and the damage that was already occurring at the joint level, surgical treatment was chosen. An 'S italic' incision was made over the radial border of the MCF joint of the thumb. We were able to confirm the proximal disinsertion of the CSF, as well as an injury also to the volar capsule. The ligament was reinserted using a threaded implant with the desired tension. Additionally, the volar capsule was repaired using a non-absorbable suture. At the end of the procedure, joint stability and reduction were checked under X-ray control.
Results: The patient was immobilised with a plaster splint for one week after which the splint was replaced by an orthosis. The patient followed a supervised rehabilitation protocol. During the follow-up, the patient showed a very satisfactory evolution, recovering full mobility in the thumb, as well as strength in pressing and gripping without any sensation of instability or discomfort. Imaging tests performed at follow-up visits showed no degenerative changes or complications. At the end of six months, the patient had fully resumed both work and recreational activity with no perceived functional limitations
Conclusions: Although injuries to the radial collateral ligament of the thumb are rare and can sometimes go unnoticed, chronic insufficiency of the radial collateral ligament contributes to significant instability of the thumb MCP joint that can lead to loss of grip strength and eventual progression to degenerative changes of the thumb metacarpophalangeal joint. Although physical examination is the cornerstone of diagnosis, stress radiographs and advanced imaging may be helpful in some cases. Complete ruptures should be treated surgically. Reinsertion of the CSF has shown good results in terms of strength and stability.

A-0403 TREATMENT COMPLICATIONS OF CARPAL TUNNEL RELEASE IN FINLAND

Oskari Rantamäki[1], Mikael Hytönen[1,2], Yrjänä Nietosvaara[1,2,5], Aleksi Reito[3,4], Ville Mattila[3,4], Matti Juntunen[1,2], Mikko Räisänen[2,4]

[1]University of Eastern Finland, Finland; [2]Kuopio University Hospital, Finland; [3]University of Tampere, Finland; [4]Tampere University Hospital, Finland; [5]Finnish patient insurance center, Finland

Introduction: Carpal tunnel syndrome is the most common peripheral nerve entrapment syndrome worldwide. Mild cases are usually treated conservatively, while surgical intervention is more common in moderate and severe cases. Although it is a relatively safe procedure, complications do occur.

Aim: The aim of this study was to identify possible areas for improvement regarding the safety of carpal tunnel release and to help improve patient satisfaction.

Material & Methods: We acquired data of all the treatment complications related to the ICD-10 code G56.0 from the archives of the Finnish Patience Insurance Center (PIC) from 2011 to 2021. The data included all the patient medical records PIC had assessed when investigating the claims, the statements of the PIC's medical advisors, and the patients' own descriptions of the complications. We also acquired the frequencies of all performed carpal tunnel releases from the Care Register for Health Care (HILMO) registry. From each claim we recorded the case descriptions, patients' ages and sexes, complication dates, hospital levels where the complications occurred (university, central, regional hospital or other), the experience of the surgeon (M.D., resident, specialist), the number of revision surgeries and their findings, and summaries of the PIC's medical advisors' statements. We calculated the overall complication incidence and categorized all complications into four groups: nerve injuries, other complications related to an inadequate surgical technique, wound infections, and other complications such as pillar pain etc. We calculated complication frequencies by groups, different level hospitals, surgeon's experience and revision surgery frequencies in all groups. Authors MR and MJ evaluated the claims independently and assessed whether the complications could have been avoided.

Results: Over the years 2011 to 2021 there were a total of 246 complications with a total complication incidence of 2,40 per 1000 surgeries. Inadequate surgical technique accounted for 31,3% of all complications, wound infections for 27,2%, others 25,2%, and nerve injuries for 16,3% respectively. 39,0% of the complications occurred in central hospitals, 29,7% in regional hospitals, 21,5% in university hospitals and 9,8% in other places such as private clinics. 56,9% of the complications occurred with a resident as a surgeon, 33,7% with a specialist, 6,1% with a surgeon of unknown experience and 3,3% with an M.D. In inadequate surgical technique group 92,2% of the complications led to a revision surgery, 55,0% in nerve injury group, 47,8% in wound infection group and 38,7% in others group respectively. MR and MJ estimated that 39,8% and 48,4% of the complications would have been preventable.

Conclusions: Carpal tunnel release is a safe operation and complications are rare. However, a significant portion of aforementioned complications relate to inadequate surgical techniques and occur most frequently with residents in hospitals where the residency typically starts (central and regional hospitals). More than half of nerve injuries and nearly all complications related to inadequate surgical techniques lead to revision surgery, which by definition is an additional and unnecessary expense, and naturally an inconvenience to the patient. In the authors' opinion these treatment complications could be avoided with appropriate education, guidance and supervision.

A-0404 THE RELATIONSHIP BETWEEN PAIN ACCEPTANCE, PHYSICAL AND BEHAVIOURAL CHARACTERISTICS IN CHRONIC PAIN PATIENTS WITH THORACIC OUTLET SYNDROME

Kimiya Hajighorbani, Tüzün Fırat, Şule Tüzen Tek
Hacettepe University, Faculty of Physical Therapy and Rehabilitation, Ankara, Turkey

Introduction: Chronic pain in TOS patients can lead significant physical and psychological limitations, impacting daily functioning. Pain acceptance, defined as the process of giving up the struggle with pain and ability to live life despite it. Understanding how pain acceptance relates to other factors, such as physical activity, pain self-efficacy, and pain catastrophizing in TOS patients, can provide valuable insights for developing effective management strategies.
Aim: This study aimed to evaluate pain acceptance and its association with pain self-efficacy, pain catastrophizing, activity patterns, and functional parameters in patients with chronic pain due to Thoracic Outlet Syndrome (TOS).
Material & Methods: A total of 39 individuals with TOS and chronic pain (mean age 37.5 years; 8 men and 31 women) were assessed. Pain acceptance was measured using the Chronic Pain Acceptance Questionnaire (CPAQ), pain self-efficacy with the Pain Self-Efficacy Questionnaire (PSEQ), and pain catastrophizing with the Pain Catastrophizing Scale (PCS). Physical activity included average daily steps and total weekly steps recorded by an activity tracker, upper extremity function assessed by the Upper Extremity Functional Index-15 (UEFI-15), and chronic pain activity patterns using the Pain and Activity Relations Questionnaire (PARQ). Correlation analyses were conducted using SPSS, with the Spearman non-parametric test applied.
Results: Positive moderate correlations were observed between pain acceptance and pain self-efficacy ($r = 0.556$, p 0.001), average daily steps ($r = 0.353$, $p = 0.30$), total weekly steps ($r = 0.379$, $p = 0.19$), and upper extremity functionality ($r = 0.370$, $p = 0.022$). Pain acceptance showed a moderate negative correlation with avoidance activity patterns ($r = -0.410$, $p = 0.011$) and pain catastrophizing ($r = -0.478$, $p = 0.002$)
Conclusions: Higher ability of pain acceptance in TOS patients with chronic pain are associated with greater pain self-efficacy, increased physical activity, and better upper extremity functionality, while correlating negatively with avoidance activity patterns and pain catastrophizing. These results suggest that supporting the pain acceptance may help reduce maladaptive behaviours such as catastrophizing and activity avoidance, both of which can exacerbate pain intensity, physical activity and functional disability. By decreasing avoidance tendencies, patients with higher pain acceptance levels may maintain more regular physical activity, leading to improve upper extremity function. Additionally, patients with greater pain acceptance demonstrated higher pain self-efficacy, indicating greater confidence in managing daily tasks despite the pain. Promoting pain acceptance could be a critical factor in improving physical functionality in TOS patients with chronic pain. Clinicians managing TOS-related chronic pain should consider incorporating acceptance-focused therapies to enhance patient outcomes by reducing avoidance behaviours and catastrophizing, while encouraging functionality, physical activity and pain self-efficacy.

A-0405 GLUCAGON-LIKE PEPTIDE-1 (GLP-1) RECEPTOR AGONIST THERAPY IS ASSOCIATED WITH DECREASED TWO-YEAR INCIDENCE OF CARPAL TUNNEL SYNDROME IN DIABETIC PATIENTS

Annika N. Hiredesai[1], Alejandro M. Holle[1], Carina P. Howlett[1], Joyce Zhuang[1], Cara H. Lai[2], Kevin J. Renfree[3], Shelley S. Noland[3]
[1]Mayo Clinic Alix School of Medicine, Phoenix, AZ, USA; [2]Department of Orthopedic Surgery, Mayo Clinic, Phoenix, AZ, USA; [3]Division of Hand Surgery, Department of Orthopedic Surgery, Mayo Clinic, Phoenix, AZ, USA

Introduction: Glucagon-like peptide-1 (GLP-1) receptor agonists are medications approved for treatment of type 2 diabetes. The inflammatory metabolic state associated with diabetes has been postulated as one mechanism for increased carpal

tunnel syndrome (CTS) incidence and severity in this patient population.
Aim: The aim of this study was to assess whether GLP-1 receptor agonist therapy was associated with decreased incidence of CTS in diabetic patients.
Material & Methods: A retrospective study was conducted using the PearlDiver database. Patients with a diagnosis of diabetes were identified using ICD-10 codes. Those prescribed GLP-1 receptor agonist therapy, liraglutide or semaglutide, were exact matched to controls for age, sex, Charlson comorbidity index, tobacco use, and obesity. Multivariate logistic regression was conducted for 2-year incidence of CTS controlling for presence of alcohol use disorder, chronic kidney disease, chronic obstructive pulmonary disease (COPD), osteoarthritis, rheumatoid arthritis, congestive heart failure, coronary artery disease (CAD), depression, hypothyroidism, cancer and insurance status.
Results: After exact matching, 500,887 GLP-1 patients were successfully matched with 500,887 controls. Patients on GLP-1 receptor agonist therapy had a significantly lower risk of being diagnosed with CTS within 2 years of medication initiation (OR: 0.92; 95% CI: 0.88 – 0.96) compared to the control cohort. In multivariate analysis, diagnoses of COPD, osteoarthritis, CAD, depression, hypothyroidism, rheumatoid arthritis were all independently associated with increased 2-year risk of CTS diagnosis. Medicare and employer-based health insurance enrollees had a significantly lower 2-year risk of CTS diagnosis (OR: 0.78; 95% CI: 0.75 – 0.81 and OR: 0.91; 95% CI: 0.85 – 0.98, respectively) while Medicaid enrollees and patients paying with cash had a significantly higher risk (OR: 1.13; 95% CI: 1.06 – 1.20 and OR: 1.28; 95% CI: 1.08 – 1.50, respectively).
Conclusions: GLP-1 receptor agonist therapy is associated with fewer diagnoses of CTS within 2 years of treatment initiation in diabetic patients. These results suggest that GLP-1 receptor agonist therapy may improve the underlying pathophysiology predisposing diabetic patients to CTS. Moreover, the association between certain insurance plans and increased CTS incidence is consistent with a multifactorial relationship between socioeconomic factors and disease prevalence in the diabetic patient population. Future study is necessary to further characterize how improved metabolic health in diabetic patients via GLP-1 therapy may reduce nervous system and musculoskeletal disease burden and improve healthcare costs.

A-0406 ASSOCIATION OF CHRONIC PAIN CHARACTERISTICS AND PHYSICAL ACTIVITY IN PATIENTS WITH THORACIC OUTLET SYNDROME: PRELIMINARY RESULTS: KIMIYA HAJIGHORBANI[1], MELDA SAĞLAM[1], AYTEN KAYI CANGIR[2], TÜZÜN FIRAT[1], ŞULE TÜZEN TEK[1]

[1]Hacettepe University, Faculty of Physical Therapy and Rehabilitation, Ankara, Turkey; [2]Department of Thoracic Surgery, Ankara University, School of Medicine, Ankara, Turkey

Introduction: Chronic pain associated with TOS can limit physical activity and affect psychological well-being. Understanding how factors such as pain intensity, duration and central sensitisation correlate with physical activity and mental health could help tailor more comprehensive interventions for TOS patients.
Aim: Thoracic Outlet Syndrome (TOS) often results in chronic pain that impacts daily life, physical activity, and mental well-being. This study investigates the relationship between chronic pain characteristics, psychological factors, and physical activity levels in TOS patients with chronic pain, aiming to identify correlations that may inform more holistic management approaches.
Material & Methods: A total of 39 individuals with TOS and chronic pain (mean age 37.5 years; 8 men and 31 women) were assessed. Pain characteristics included pain intensity at rest, during activity, and at night (measured by Visual Analog Scale, VAS); pain duration (measured in months); and central sensitization (measured by the Central Sensitization Questionnaire). The Pain Catastrophizing Scale (PCS) for catastrophizing and the Pain Self-Efficacy Questionnaire (PSEQ) for pain self-efficacy. Psychological status was further assessed with the Depression, Anxiety, and Stress Scale-21 (DASS-

21), targeting depression, anxiety, and stress levels. Physical activity was evaluated by tracking average daily and total weekly steps via an activity tracker. Spearman non-parametric test was used for analysing data.
Results: Preliminary finding of our analysis revealed no significant positive or negative correlations between most chronic pain characteristics and physical activity. However, a weak negative correlation was observed between pain duration and average daily steps ($r = -0.350$, $p = 0.029$), suggesting that individuals with a longer duration of chronic pain may engage in lower daily physical activity. No significant associations were found between central sensitization, pain catastrophizing, or pain self-efficacy with either average daily steps or total weekly steps. Furthermore, no correlations were observed between physical activity levels and psychological factors such as depression, anxiety, and stress
Conclusions: Preliminary results suggest that there is a limited associations between chronic pain characteristics, psychological factors, and physical activity in TOS patients with chronic pain, with the exception of a weak negative correlation between pain duration and average daily steps. The absence of significant relationships between pain catastrophizing, pain self-efficacy, central sensitization, and physical activity indicates that, in TOS patients, these psychological and pain-related factors might not directly predict physical activity levels. As this study continues, further analysis will be conducted with a larger sample size to clarify the relationships among chronic pain characteristics and physical activity. Future results will inform potential strategies to support sustained physical engagement in TOS patients, especially for those experiencing chronic pain.

A-0407 EVALUATING THE COGNITIVE FACTORS IN THORACIC OUTLET SYNDROME PATIENTS WITH CHRONIC PAIN: INFLUENCE OF ATTENTION AND WORKING MEMORY ON EXERCISE ACCURACY

Kimiya Hajighorbani, Tüzün Fırat, Şule Tüzen Tek
Hacettepe University, Faculty of Physical Therapy and Rehabilitation, Ankara, Turkey

Introduction: TOS is characterized by the compression of the nerves and vessels in the thoracic outlet, leading to chronic pain and functional impairments. While much focus has been placed on the physical aspects of TOS, there is a growing need to investigate cognitive factors, such as attention and working memory, that may influence the effectiveness of rehabilitation exercises. This study was conducted to investigate the potential role of these cognitive domains in the performance of home exercises prescribed to TOS patients.
Aim: The aim of this study was to examine the relationship between attention, working memory, and the accuracy of home exercise performance in individuals with chronic pain due to Thoracic Outlet Syndrome (TOS), and to identify how these cognitive factors impact the learning and adherence to home exercise regimens.
Material & Methods: The study included 32 patients (mean age 31.5 years; 3 men and 29 women) with chronic TOS-related pain persisting for over six months. Demographic data and clinical characteristics were collected, and cognitive function was assessed using the Serial Digit Learning Test to measure attention and working memory. Then, participants were prescribed a set of seven home exercises, with the correct performance of these exercises assessed through live demonstrations. Exercise accuracy and adherence were evaluated immediately after prescription using the Exercise Assessment Scale. The statistical analysis was performed using SPSS, and correlations were calculated using the Spearman's correlation test to explore the relationships between cognitive factors, exercise performance, and pain duration.
Results: Finding indicated a moderate positive correlation, and exercise accuracy (correlation coefficient = 0.443, $p=0.014$). Patients with poorer attention and working memory demonstrated lower accuracy in performing the exercises. Additionally, a moderate negative correlation was found between the duration of TOS-related pain and both working memory (correlation coefficient = -0.419, $p=0.017$) and exercise accuracy (correlation coefficient = -0.504, $p=0.005$).

These results suggest that longer durations of chronic pain may impair learning and memory function, leading to a decline in exercise performance accuracy.
Conclusions: This study highlights the critical role of cognitive factors, particularly attention and working memory, in the successful performance of prescribed home exercises in patients with TOS-related chronic pain. The findings suggest that chronic pain may hinder cognitive function, ultimately affecting rehabilitation outcomes. Given these findings, to enhance exercise performance and adherence, it is crucial to develop effective strategies for teaching and reinforcing home exercises in this population. Tailored approaches, such as incorporating visual aids, step-by-step instructional videos, and frequent follow-up sessions, may help patients better retain exercise instructions. Additionally, attention-enhancing exercises could be integrated into rehabilitation programs to strengthen working memory and attention.

A-0408 A REVIEW OF TOTAL (SEMICONSTRAINED) DISTAL RADIO ULNAR JOINT REPLACEMENTS IN NEW ZEALAND OVER A TEN YEAR PERIOD

Katharine Hamlin, Becky Sheehy, Karen Smith
Middlemore Hand Service, Auckland, New Zealand

A retrospective review of semiconstrained Distal Radio Ulnar Joint (DRUJ) Replacements performed in New Zealand between 2010 and 2020 was undertaken to assess survivorship, clinical outcome and complications.
The aim was to perform a comprehensive nationwide audit.
After gaining consent, patients were assessed by an independent observer (hand surgeon/hand therapist) according to a clinical and radiological protocol, at a minimum of 2.5 years from surgery.
There were 47 joints replaced in 44 patients; 34 joints in 31 patients were formally reviewed giving a capture rate of approximately 74%. The follow up period was 2.5 to 13 years with a mean of 6.6 years. There were 2 failures (revised to custom made implants) a survivorship rate of 94%. Clinically, 78% of patients had more than (or equal to) 70% resolution of the main reason for their surgery and 81% would repeat their operation again. A mean range of supination/pronation of 71/79 degrees and mean grip strength of 21 kilograms was obtained. Complications occurred in 17 joints (50%) 2 showed signs of loosening and there were 7 cases of chronic/severe pain. The reoperation rate was 29%.
Our results are comparable to those in the literature, confirming the good clinical outcome of a semiconstrained DRUJ replacement, for what is often a difficult problem. Multiple operations and a wrist fusion on the contralateral side was noted to be associated with poorer results. Our survivorship rate of 94% is consistent with others, but with 2 joints replacements assessed to be loosening, (and so will eventually fail) we will continue to limit these replacements to an older population if possible.

A-0409 OUTCOMES OF WRIST ARTHRODESIS IN ADVANCED WRIST ARTHRITIS: A RETROSPECTIVE MULTICENTRE COHORT STUDY

MW Archunan[1,2], A Ignatescu[1], R Hayes[1], T Benkhadra[1], S Uwaoma[3], B Boumalha[2], MC Yao[3], M Dunne[3], R Brankin[2], J Stanton[2], M Wood[3], P Crossman[1]
[1]Ipswich Hospital, East Sussex and North Essex NHS Trust, UK; [2]Colchester General Hospital, East Sussex and North Essex NHS Trust, UK; [3]West Suffolk NHS trust, UKAim: Evaluate the value of wrist arthrodesis in managing advanced wrist arthritis by analysing complication and reoperation rates, alongside patient-reported outcomes related to disability and satisfaction.

Method: This multi-centre retrospective study involved three hospitals in the East of England. Clinical records and surgical

notes were reviewed. Patients who underwent wrist arthrodesis between 2009 and 2024 were identified, yielding 111 initial cases. After applying inclusion criteria - osteoarthritis or post-traumatic arthritis - and treating bilateral procedures as separate episodes, 63 patients were included in the final analysis. Outcomes were further assessed using a patient questionnaire incorporating the Patient-Reported Wrist Evaluation (PRWE) scores for pain and function, with additional questions on satisfaction and willingness to recommend the procedure.
Results: The overall complication rate was 7.9% (5/63), including three incidence of carpal tunnel syndrome, one incidence of haematoma, and one incidence of infection. The reoperation rate was also 7.9% with four patients requiring carpal tunnel decompression and one patient requiring debridement and revision. 41 patients completed the follow-up questionnaire at a mean 7.6 years post-surgery. They reported a mean PRWE pain score of 11.5/50, mean PRWE function score of 13.6/50, giving a mean PRWE total score of 25.1/100. Patient satisfaction ratings were high: general satisfaction scored 8.7/10, likelihood to recommend the procedure 8.2/10, and satisfaction with care received 9.3/10.
Conclusion: Wrist arthrodesis is a valuable surgical option for advanced wrist arthritis, demonstrating high patient satisfaction and sustained functional improvements over long-term follow-up, alongside low complication and reoperation rates. Our findings affirm its role in providing reliable, long-term relief from arthritis-related wrist pain and disability. A limitation of the study is the lack of baseline disability scores prior to surgery, which could provide additional context for evaluating outcomes.

A-0410 P FRAME AS A HAND-MADE ADJUSTABLE EXTERNAL FIXATOR FOR TREATMENT OF COMPLEX SYNDACTYLY

Reza Sh. Kamrani
Tehran University of Medical Sciences, Tehran, Iran

Introduction: Syndactyly is the most common congenital anomaly in hand. External fixator has been used for improving dressing of syndactyly or better management of syndactyly. We use an adjustable, hand-made external fixator (P Frame) in brachysyndactyly.
Aim: Results of a simple external fixator in brachysyndactyly
Material & Methods: Patients with brachysyndactyly from Jan 2014 to Dec 2022 who has been undergone surgical release reviewed. P Frame is a connective hallow 2.5 mm tube with two vertical screws which stuck the pins within them after tightening the screws. After releasing the syndactyly, a longitudinal pin inserted in separated finger which cross at least one of the finger joints. Distal end of the pins was bent one centimeter far from fingertip and connected with the bent pin of the adjacent finger to made a P Frame. The frame was removed after 4 weeks. We reviewed inter and post-operative complications of our patients means, difficulty with suturing of the incisions and skin grafts, wound infection, pin tract infection, premature pin extrusion or breakage, satisfaction of the parents with respect to dressing, web creeping and operated fingers' range of motion.
Results: 33 web space in 21 patients in 25 operations were released with this technique. They were followed for one to five years (mean 31 months) The surgeons and surgeon assistants were satisfied with this technique (4.3/5). Wound infection appeared in 4 web space without skin graft loss and resolved with dressing. There were two pin tract infection and one pin migration and one fixator loosening. There were 4 web creeping. The parents were satisfied with changing dressing with P Frame (4/5). None of fingers showed deterioration of the range of motion.
Conclusions: we saw better position holding by surgeon assistant with P frame intraoperatively. We had 4 complication related to external fixator and pins which did not affect the results of treatment. Wound infection and web creeping was compatible with literature. We found that insertion of P frame at least facilitates the operation issues and changing dressing without increasing the complications.

A-0411 RECONSTRUCTION OF DISTAL ULNA AFTER GIANT CELL TUMOR RESECTION

Barbaric Starcevic Katarina[1], Bohacek Ivan[2], Starcevic Damir[1]
[1]Akromion, Special Hospital for orthopedics and traumatology, Zagreb, Croatia; [2]School of Medicine and Department of Orthopaedic Surgery, University Hospital Centre Zagreb, Croatia

Introduction: Giant cell tumor (GCT) of the distal ulna is rare, locally aggressive tumor with high rate of recurrence. Wide en-bloc resection of the distal part of the ulna, with or without stabilization of the ulnar stump is the recommended treatment option. Functional results after that kind of surgery are mostly satisfying but, in some cases, it can result in wrist instability, causing pain and weakness of the grip strength. That is why in young people, with high functional demands, we prefer reconstruction of distal ulna and distal radioulnar joint after en-block resection of the distal ulna.
Aim: We present our operative technique for reconstruction of the distal ulna and distal radioulnar joint after GCT resection.
Material & Methods: Distal ulna is reconstructed with autologous free fibular graft with autologous free fibular graft and the distal radioulnar joint stabilized with an autologous palmaris longus tendon graft. We present our operative technique and good functional results of three young patients treated with this procedure.
Results: All our operated patients are feeling well, have no major difficulties coupled with a satisfactory range of motion on the control follow-up examinations. The grip strength of operated arm is similar to the contralateral side. They have returned to work and have no major disturbances in performing daily activities. Control X-rays shows adequate integration of fibular graft at the site of osteosynthesis, with no signs of tumor recurrence. DRUJ are stable and pain free in all cases.
Conclusions: Our results confirm the hypothesis that the reconstruction of the distal ulna and distal radioulnar joint leads to a satisfactory functional result in young and active patients with higher functional demands.

A-0412 EXTENT OF MALUNION IN DISTAL RADIUS FRACTURES AND ITS CLINICAL RELEVANCE

Yves Waser, Mauro Maniglio, Lea Estermann, Lisa Reissner, Andreas Schweizer
University hospital Balgrist, Zurich, Switzerland

Introduction: Malunited distal radius fractures often present with restricted range of motion, reduced grip strength, and pain. Anatomical restoration is essential for achieving a functional range of motion and for adequate force and load transmission. Corrective osteotomy is the treatment of choice. Several studies have shown that nearly anatomical reconstruction is achievable through 3D-planned corrective osteotomies. However, the extent of correction necessary to achieve measurable change in mobility and strength remains unknown.
Aim: This study aims to determine the degree of malalignment that warrants correction to achieve significant improved postoperative outcomes (range of motion, grip strength).
Methods: Patients from 2017 to 2023 who underwent extra-articular corrective osteotomy for malunited distal radius fractures at our clinic and had a minimum follow-up of six months were included. Clinical data were extracted from pre- and postoperative evaluations, including pre- and postoperative range of motion (ROM), grip strength using a Jamar dynamometer, and the presence of ulnar impaction symptoms. Malalignment analyses and 3D osteotomy planning were routinely conducted and sourced from the hospital's medical imaging platform. The operations were performed with 3D-printed guides.
Results: A total of 67 patients (mean age 43 years; 47 females, 20 males) met the inclusion criteria. Of these, 49 patients received a palmar correction, with a mean correction angle of 19° (SD 11°), resulting in an average flexion improvement of 13° (SD 19°, $p = <0.001$) and an average total ROM improvement (flexion + extension) of 12° (SD 27°, $p = 0.001$). A

significant, positive correlation was observed between the degree of palmar correction and flexion improvement from pre- to postoperative ($r = 0.46$, $p = <0.001$), with an average flexion increase of 0.77° per degree of correction (SD 19°). Extension was not significantly impacted ($p = 0.49$), showing no negative correlation with palmar correction.
Among the cohort, 32 patients presented with ulnar impaction symptoms; 27 underwent lengthening of the radius. Of these, 70% reported no ulnar pain on postoperative clinical examination. Additionally, a significant increase in grip strength ($p = <0.001$) was noted from pre- to postoperative assessments, independent of the amount of correction or lengthening magnitude.
Discussion/Conclusion: Our patient cohort primarily presented with severe malalignments. This study demonstrates that ROM can be significantly improved in direct proportion to the degree of correction, particularly in flexion, without negatively impacting extension. For patients with symptomatic malunions, even minimal corrective osteotomies yield symptom relief. Based on current quality control data, the average postoperative SANE score is 78, with 90% of patients reporting symptom improvement postoperatively, and none reporting worsening.

A-0413 UTILITY OF NON-VASCULARISED HEMIMETATARSAL TRANSFER IN THE OLDER CHILD

Henry de Berker, Wee Sim Khor, Eleanor Lumley
Department of Plastic Surgery, Royal Preston Hospital, UK

Introduction: Non-vascularised hemimetatarsal graft has been used to reconstruct the thumb of infants with Manske type IIIb and IV hypoplasia in whom sacrifice of the index finger for pollicisation is deemed unacceptable. However, there is no documented use in older children.
Aim: To establish the feasibility and utility of the non-vascularised hemimetatarsal graft in an older child requiring bone reconstruction of the thumb.
Material & Methods: This is a case report about an 11 year old child with severe autism who presented with a circumferential degloving injury to the left thumb proximal phalanx from a human bite. Serial washout and debridement revealed a composite bone and soft tissue defect comprising a 2x2cm dorsal wound between the distal interphalangeal joint and metacarpophalangeal joint. The proximal phalanx was completely devitalised in addition to an epiphyseal fragment of the distal phalanx. The soft tissue defect was reconstructed using a first dorsal metacarpal artery flap, with a cement spacer whilst he was treated with antibiotics and the flap healed. Four weeks later, the bony defect was reconstructed with double-barrelled hemimetatarsal graft taken from the 4th toe of the contralateral foot. This was secured with cerclage wires and a single axial Kirschner wire, which was removed 3 weeks post procedure. The donor site was kept in a dynacast until removal of K wires. Weight-bearing restrictions were not possible for this patient.
Results: Post operative radiographs 8 weeks following the hemimetatarsal graft showed callus formation, indicating bony union. The child's parents reported that he was using his thumb as normal without complaining of pain or difficulty. He did, however, complain of pain from the donor site. Radiographs of the donor foot at 8 weeks post operatively showed a healing fracture with callus formation.
Conclusions: A double-barrelled hemimetatarsal provides an excellent cortico-cancellous graft that is size matched for phalangeal bone loss. The graft is easy to obtain and there is minimal donor morbidity. Although this patient experienced donor site morbidity, we believe that this could be mitigated by a longer period of cast immobilisation and may be less likely in a child who could follow weight-bearing restrictions.

A-0414 RUMPEL – LEEDE PHENOMENON. AN UNUSUAL COMPLICATION OF TORNIQUET USE

Katarina Barbaric Starcevic[1], Marko Krpeljevic[2], Damir Starcevic[1]
[1]Akromion, Special Hospital for orthopedics and traumatology, Zagreb, Croatia; [2]Department of orthopaedic surgery, University Hospital Centre Zagreb, Croatia

Introduction: The Rumpel-Leede phenomenon is a rare disorder manifested by the rupture of capillaries in the dermis in response to the application of compression to the limb when using the torniquet.
Aim: We present the case of the patient who developed Rumpel-Leede phenomenon during the operative decompression of the carpal tunnel.
Material & Methods: A 58-year-old patient, diabetic, was treated surgically for carpal tunnel syndrome of the right hand. Under local anesthesia and short-term torniquet use for seven minutes, decompression of median nerve was performed using the usual procedure. After removing the torniquet, a changed appearance of the skin of the entire arm was observed, with numerous petechiae and a clear border at the place where the torniquet was. The patient was free of complaints, but elevated blood pressure values were observed. A control blood count was immediately performed showing a lower platelet value compared to the preoperative findings.
Results: At follow-up exams, the skin changes became increasingly pale, and two weeks after the procedure they completely resolved. The patient did not have any problems. The wound has healed neatly and problems related to carpal tunnel syndrome were solved.
Conclusions: The Rumpel-Leede phenomenon is an extremely rare complication that can occur when using a torniquet during surgical procedures on the upper limb. Patients with diabetes and hypertension and people with more fragile platelets are particularly at risk. Although impressive in appearance, this phenomenon does not have consequences on the operated arm, but we should be aware of this possible complication.

A-0415 EFFECTS OF METFORMIN USE ON NERVE ENTRAPMENT DISORDERS IN UPPER LIMB: A NATIONWIDE COHORT STUDY OF THE SWEDISH POPULATION

Caroline Sevcik[1], Raquel Perez[1], Malin Zimmerman[1,2], Mattias Rydberg[1], Juan Merlo[1,3], Lars B Dahlin[1,4]
[1]Lund University, Malmö, Sweden; [2]Helsingborg Hospital, Helsingborg, Sweden; [3]Region Skåne, Malmö, Sweden; [4]Linköping University, Linköping, Sweden

Background: Carpal tunnel syndrome (CTS) and ulnar nerve entrapment (UNE) are common entrapment neuropathies that may require surgery. Diabetes mellitus (DM) is a recognized risk factor, with a well-established link to CTS, although its association with UNE is less certain. As DM prevalence rises in the general population, a corresponding increase in CTS and UNE cases is anticipated.
Metformin, a first-line treatment for type 2 diabetes (T2D), provides both glucose-lowering and potential neuroprotective effects. Preclinical studies indicate that metformin may reduce neuropathic pain. Moreover, clinical studies have shown metformin's efficacy in alleviating musculoskeletal and chronic back pain in T2D patients. Given its antifibrotic properties, metformin could also be particularly relevant for CTS, where subsynovial connective tissue fibrosis contributes to nerve dysfunction and pain. We aimed to assess the potential impact of metformin use in T2D patients on the occurrence of CTS and UNE and on the need for surgical intervention – an area that remains unexplored.
Methods: In a population-based cohort study, 6,808,462 individuals' data from five linked Swedish national registers, excluding individuals with prior CTS/UNE, non-T2D, death, emigration, or missing birth country, were evaluated.

Baseline was set at first CTS/UNE diagnosis (2011-2014) or January 1, 2011, if none. T2D was defined by ICD-10 diagnosis or antidiabetic dispensation within five years. Surgical CTS/UNE treatment was identified via NOMESCO codes within one year. Cases with diabetes were categorized by treatment: non-pharmacologically treated, metformin, metformin combination therapy, and other medications. Multinomial regression, adjusted for demographics and comorbidities, was used to express relative risks (RR) (95% confidence intervals; CI).
Results: Among 52,975 CTS and 9,928 UNE cases identified, individuals with T2D had an elevated risk of both conditions and were more likely to require surgical intervention. Risk patterns varied across demographic and health characteristics: both CTS and UNE risks were highest in middle-aged adults (35-64), with UNE risk lower in those over 80. Women had a higher risk for CTS but slightly lower for UNE. Increased risks for both conditions were associated with lower income and cardiovascular disease, while diabetic complications specifically correlated with higher CTS risk.
Stratified analysis showed that metformin combination therapy increased CTS risk [1.24 (1.10–1.39)], while metformin alone and other diabetes medications had no significant effect. All diabetes treatments reduced UNE risk [e.g., metformin: 0.72 (0.55–0.94)]. For surgical interventions, lower RRs were observed for UNE across treatments [e.g., metformin: 0.59 (0.40–0.87)], while non-surgical UNE rates showed no variation. No significant differences in CTS intervention rates were found across treatments.
Conclusion: Pharmacologically treated T2D patients appear to have a reduced risk of UNE and need for surgery compared to non-pharmacologically treated T2D patients. Elevated risk of CTS in patients on metformin combination therapy may reflect challenges in managing more severe diabetes, even after adjusting for complications like cardiovascular disease, nephropathy, and retinopathy. These findings suggest that optimizing T2D treatment may offer preventative benefits for UNE. Overall, the results highlight the distinct characteristics of CTS and UNE and underscore the need to further understand differences in their pathophysiology.

A-0416 HIGH RADIAL NERVE PALSY AFTER CROSSFIT TRAINING

Nerea Martinez-Franco, Adriana Martinez-Catasus
Hospital Sant Rafael, Barcelona, Spain

Introduction: Peripheral neuropathies are commonly seen by upper limb orthopedic surgeons. High radial nerve compression, though less common, can cause significant symptoms along the radial nerve, extending from the brachial plexus to the cubital fossa. This compression can occur in areas such as the lateral triceps, where a fibrous band may press on the nerve, especially in cases of humeral fractures or muscle hypertrophy.
Material & Methods: A 31-year-old woman reported burning pain in the back and lower part of her right arm, along with numbness in her hand, after 13 days of CrossFit training. Physical examination showed no muscle weakness or atrophy, but there was limited wrist extension. Ultrasound suggested Lotem syndrome, and electromyography revealed mild radial nerve injury near the triceps with signs of active nerve healing.
Results: Initial treatment with physiotherapy and gabapentin led to partial symptom relief, but her symptoms worsened. A follow-up ultrasound showed fibrosis around the radial nerve, and hydrodissection with saline, lidocaine, and corticosteroids was performed, resulting in complete symptom resolution within 15 days.
Conclusions: Radial nerve paralysis from unusual muscle exertion, such as intense elbow movements, is rare. First described by Gowers in 1892 and later by Lotem. This condition can cause sensory and motor deficits along the nerve's path and is worsened by activities that promote muscle hyperthrophy, such as weight training. Compression typically occurs near the triceps due to a fibrous band that adds pressure, especially with muscle edema. Conservative management (rest,

weight reduction, NSAIDs, hydrodissection) is recommended first, with surgery as secondary option. Recognizing Lotem syndrome is key for effective treatment.

A-0417 SURGICAL SOLUTIONS FOR GUNSHOT BONE DEFICIENCIES IN THE HAND AND FOREARM

S. Tymoshenko[1], M. Kotova[1], I. M. Kurinnyi[1], A. Lysak[2]
[1]SI "Institute of Traumatology and Orthopedics of NAMS of Ukraine"; [2]Main Medical Clinical Center of the Ministry of Internal Affairs of Ukraine

Introduction: Gunshot fractures have distinct pathophysiological features and typically include primary and secondary bone defects. Extensive bone loss, soft tissue scarring, complex injury structures, and persistent infection often complicate treatment. In conditions with limited orthopedic resources, such injuries demand precise, effective, and streamlined solutions adapted to the injury's specifics.

Aim: To identify the most effective bone grafting techniques for managing complex gunshot-related injuries in the hand and forearm.

Material & Methods: Since 2022, we have analyzed outcomes of 70 cases with gunshot-related bone defects in the hand and forearm, with 24 carpal bone defects, 27 metacarpal bone defects, and 19 forearm bone defects.

Injury characteristics varied by weapon type: 5 cases were bullet injuries, 54 were shrapnel, and 11 were mine explosion injuries. Each long bone defect was categorized by its size as moderate, large, or massive, relative to the defect-to-diameter ratio. Moderate defects were less than one diaphyseal diameter in length, large defects were between one and two diameters, and massive defects were over two diameters. In the carpal region, a large defect involved bone loss affecting either the radiocarpal or midcarpal joint, while a massive defect involved both joints.

Outcomes of free bone grafting were analyzed concerning defect size. Treatment options also included free microvascular fibular autografting, single-bone forearm creation, the Masquelet technique with a spacer and induced membrane, and bone transport. Postoperative evaluations were conducted at 1, 3, and 6 months, focusing on nonunion rates, fixation loss, and secondary interventions.

Results: For most metacarpal, carpal, and forearm bone defects, a free corticocancellous graft from the iliac crest was an effective reconstructive method. Moderate defects achieved union in 100% of metacarpal and carpal cases and 88% of forearm cases. In large defects, union rates were 90% for metacarpal, 100% for carpal, and 86% for forearm bones. In massive defects, union rates dropped to 78% for metacarpal, 89% for carpal, and 67% for forearm cases.

For massive metacarpal and forearm defects, using a vascularized bone graft resulted in an 83% union rate. Shortening of the segment or both bones was a viable option for moderate and large carpal defects, as well as forearm defects. Due to extensive soft tissue damage, shortening of metacarpal bones was unfeasible in 22 of 27 cases with metacarpal defects. In massive forearm defects, creating a single-bone forearm was used as an alternative. Carpal bone defects were treated with options like row removal and partial or complete wrist arthrodesis.

Secondary procedure rates due to nonunion were below 12%, requiring only additional bone grafting.

Conclusions: In gunshot injuries, using standard bone grafting methods and osteosynthesis for the forearm, carpal, and hand defects result in acceptable nonunion and complication rates. Under the constraints of military healthcare, these findings suggest that it is feasible to accelerate and simplify reconstructive procedures where appropriate.

A-0418 GLOMUS TUMOR-RELATED WARTENBERG'S SYNDROME - AN UNUSUAL DIAGNOSIS

Ricardo Teixeira, Sónia Rodrigues, Pedro Chaves, Catarina Rodrigues, Raquel Marques
ULS Médio Tejo, Abrantes, Portugal

Introduction: Glomus tumor is a rare benign neoplasm that accounts for less than 2% of hand tumors. The most frequent location, in 50% of cases, is subungual, and it is rare in other locations. Due to their small size, they sometimes go unnoticed on inspection and palpation on objective examination. The most common symptoms are local pain, hyperalgesia and sensitivity to thermal changes.
Material & Methods: We present a case of an 82-year-old male patient, autonomous, in excellent general condition, who went to the outpatient clinic for shock-like pain at the radial edge of the wrist.
He reported shock-like pain and hyperalgesia, difficulty in using a wristwatch, which had been going on for about 2 months. On objective examination, he had a mass of around 8mm in diameter, with a duroelastic consistency, in the region of the anatomical snuffbox. He had a positive Tinel and Finkelstein test and paresthesia in the area of the sensory radial nerve. We opted for excision of the mass and exploration of the sensitive radial nerve, which the patient accepted.
Results: One month after surgery, the patient had no pain and normal sensitivity. The histological examination revealed that it was a glomus tumor.
Conclusions: Glomus tumors are benign neoplasms whose resection is curative, with low recurrence rates. However, diagnosis can be difficult and requires a high degree of clinical suspicion. Diagnostic delay is frequent and results in high morbidity for the patient. We present a rare case of Wartenberg's syndrome differential diagnosis.

A-0419 PHENOTYPE AND ASSOCIATED ANOMALIES IN A 25-YEAR COHORT OF 145 PATIENTS WITH RADIAL LONGITUDINAL DEFICIENCY

Ishanee Nirmalanathan, Elias Tallay, Mona Irene Winge og Ida Neergård Sletten
Division of Orthopaedic Surgery, Oslo University Hospital, Oslo, Norway

Introduction: Radial longitudinal deficiency (RLD) is the most common longitudinal reduction defect in the upper extremity, with incidences of 1.1-1.6/10 000 newborns in previous Nordic studies. This CULA (congenital upper limb anomaly) can be uni- or bilateral, isolated or part of a syndrome. The phenotype/severity is classified according both to James'/Goldfarb's modified Bayne and Manske's modified Blauth classifications. Previous smaller Nordic studies have found a high rate of bilaterality (45-59%) and associated anomalies (55-92%) in children with RLD. Our unit has treated the majority of RLD patients in Norway.
Material & Methods: We analysed the upper limb phenotype, associated anomalies and syndromes in all RLD patients, including thumb hypoplasia only, in the CULA North Oslo Registry. From May 2018 to November 2024, we have consecutively included and classified all our unit's patients prospectively at first referral. We have also retrospectively included and classified patients treated since January 1999 based on their medical records and radiographs.
Results: We identified 223 extremities with RLD in 145 patients. Seventy-eight (54%) had bilateral and 67 (46%) unilateral affection. Of the 78 patients with bilateral RLD, 29 (37%) had identical phenotypes, while 49 (63%) had different subtypes. Forty patients had unilateral right-sided and 27 unilateral left-sided RLD. Four of the patients with unilateral RLD had another CULA in the contralateral upper limb (two radial polydactyly, one amniotic band syndrome, and one camptodactyly). We classified 138 upper limbs as Bayne type N/0 (thumb/carpal anomaly), 44 as type I (>2 mm shortening distal radius), two as type II (hypoplastic radius), five as type III (partial absence of radius), 34 as type IV (complete absence of radius) and none with type V (proximal humerus absence).

One hundred and eighty-eight hands could be classified according to Manske's modified Blauth hypoplastic thumb classification as type I (n=6), type II (n=51), type IIIa (n=59), type IIIb (n=22), type IV (n=23), and type V (n=27). Twelve hands had hypoplastic triphalangeal thumbs, while 23 hypoplastic thumbs were unclassifiable.
In total, 90 (62%) patients had one or more other types of anomalies. Thirty-nine (27%) had other musculoskeletal anomalies in the lower limbs or spine, and 84 (58%) had anomalies/ dysfunction in other organ systems, of which 44 (30%) had a cardiac anomaly.
Forty-five (31%) patients had a syndrome; among these, VACTERL association in 20 (14 %), Fanconi anaemia in six (4.1 %), Holt-Oram in four (2.7%), DiGeorge in three (2.0%) and thrombocytopenia absent radius (TAR) in two (1.4%). The geneticists evaluated 82 patients; a gene mutation was found in 25 (17%).
Surgery was indicated in 111 (77%) patients
Conclusions: A bilateral RLD with two different subtypes was the most common phenotype. We found most Bayne types N/0-I and IV and a high number of associated anomalies as reported in previous studies. We recommend additional assessments of RLD patients to identify potential other anomalies and genetic testing to rule out Fanconi anaemia, which left untreated has high lethality.

A-0420 SENSORY NERVE TRANSFER IN UPPER LIMB

Maria Imtiaz, Rajive Jose, Dominic Power
Queen Elizabeth Hospital Birmingham

Introduction: Nerve transfer for motor nerve paralysis is an established technique for treating complex nerve injuries. However, nerve transfer for sensory reconstruction has not been widely published. Sensory nerve transfer is used as part of the reconstructive toolbox in a tertiary referral peripheral nerve injury service in selected cases with the aim of reducing neuropathic deafferentation pain or for restoration of protective sensation in critical denervated areas of skin.
Aim: Identify the outcomes of sensory nerve transfer
Material & Methods: A database of all nerve transfers in our unit over a 10-year period to 2023 was interrogated and identified 786 nerve transfers including 39 sensory nerve transfers with at least 3 months follow up. The data was examined independently by two different surgeons, and where any difference or ambiguity occured it was discussed.
35 patients (6 females, 29 males) underwent 39 sensory nerve transfers. Recording of sensory outcome data was heterogenous and included Static and Moving 2PD using the Disk-Criminator wheel, Semmes Weinstein monofilaments, assessment of hypersensitivity and neuropathic pain measured by visual analogue scale, SLANSS and Doleur Neuropathique 4.
Outcome where available was classified using the Highet classification where "Excellent" represents S4 and S3+, "Good" S3, Fair S2 and Poor S1 and S0 using the Mackinnon and Dellon modification of the sensory Medical Research Council grading system for nerve recovery.
Complications including neuroma at co-aptation site were also recorded.
Results: We retrospectively examined records for 35 patients (6 females, 29 males) with a mean age of 43.1 years (range: 21.1–79 years) and an average follow-up of 19.44 months (range: 3–88 months). Etiologies included Brachial Plexus Injury (BPI, n=14), peripheral nerve injuries (n=13), oncology (n=7), spinal cord injury (SCI, n=4), and infected compartment syndrome (n=1).According to this grading of the 39 nerve transfers performed; 4 nerve transfers were successful (etiology: n=3 BPI, n=1 PNI), 11 nerve transfers were partially successful (etiology: n=4 BPI, n=1 SCI, n=6 PNI) 11 nerve transfers failed (n=4 BPI, n=4 PNI, n=2 Oncology, n=1 infected compartment syndrome). One patient remains under ongoing follow-up, and results were either undocumented or lost to follow-up for 12 patients.

Of the 39 sensory nerve transfers, 31 were direct end-to-end transfers (n=3 successful, n=8 partially successful, n=10 failed, n=9 lost to follow-up, n=1 ongoing), 4 were end-to-side transfers (n=1 partially successful, n=1 failed, n=2 lost to follow-up), 3 were end-to-end transfers with autologous nerve grafts (n=2 partially successful, n=1 lost to follow-up), and 1 was an end-to-end transfer with an allograft (n=1 successful).
Five nerve transfers had complications on follow-up, though no neuromas were observed at the final follow-up
Conclusions: The scarcity of data and limited patient follow-up limit the ability to determine sensory nerve transfer success, due to small subset of patient we suggest a collaboration for multi-centric results.

A-0421 THE DISTRIBUTION AND EFFICACY OF CORTICOSTEROID IN THE TENDON SHEATH AFTER TRANSTENDINOUS INJECTION FOR TRIGGER DIGIT - A RADIOLOGIC AND CLINICAL STUDY

Hasan Bitar[1,2], Johanna Bergman[3], Joakim Strömberg[1,2]
[1]University of Gothenburg, Sahlgrenska Academy, Department of Clinical Sciences, Gothenburg, Sweden; [2]Department of Surgery and Orthopedics, Alingsås Lasarett, Alingsås, Sweden; [3]Department of Radiology, Alingsås Lasarett, Alingsås, Sweden

Background: Corticosteroid injection for trigger digit can be performed using different techniques, most commonly over the A1 pulley. Taras et al. 1998 JHS am, showed that in 17% of attempted intra-sheath injections at the A1 level, the solution only reached subcutaneous tissues without impairing the outcome. Another technique, in which the needle is passed through the tendon to the bone and retracted, has been described, but no morphological studies on the distribution of the injected corticosteroid have been reported previously.
Aim: The primary aim of this study was to morphologically examine how the corticosteroid solution spreads after transtendinous injection at the proximal phalanx, and to determine the rate of intra-sheath targeting by adding radiographic contrast to the corticosteroid. A secondary aim was to follow symptoms and analgesic use on a day-by-day basis over 6 weeks after injection.
Methods: A 1 mL solution of the corticosteroid Depo-Medrol lidocaine (40mg/mL+10mg/mL) with 0.5 mL radiopaque dye (Omnipaque-300) was injected in the proximal phalanx using a transtendinous approach. When bone contact was achieved, the needle was slightly retracted, and the solution was injected. Frontal and lateral x-ray projections were performed immediately. Follow-up forms were sent to patients for daily recording of pain, stiffness, and triggering using the visual analogue scale (VAS) over 6 weeks and for completion of the HQ-8 questionnaire every week.
Results: 13 patients (5 males and 7 females), with a mean age of 62 years (SD 14) were included. X-ray imaging showed an intra-sheath spreading of the injected solution in all 13 patients, as well as subcutaneous component that varied in size. In 7 patients, the solution filled the whole sheath along with the tendon from palmar fascia to distal phalanx. All patients sent in complete follow up forms. Nine patients (69 %) reported complete relief of all symptoms within six weeks. The mean number of days for symptom resolution was 9.5 (SD 10.3) for pain, 11.5 (SD 9.9) for stiffness, and 7.4 (SD 5.1) for triggering. The mean number of days of analgesic use was 1.4 (SD 2.6) days for paracetamol and 1.5 (SD 2.8) days for ibuprofen; 8 patients (62%) did not take any analgesics.
Conclusion: Injection in the proximal phalanx with a transtendinous technique results in higher precision of intra-sheath spreading of the injected solution in trigger digit. Triggering was the first symptom to resolve, followed by pain and stiffness. The use of analgesics was low, and almost two-thirds of patients did not need any analgesics.

A-0422 OUR EXPERIENCE WITH AN ARTHROPLASTY FOR THE TREATMENT OF TRAPEZIOMETACARPAL ARTHRITIS

Beatriz Fernández Bran, Raquel Castro Salvador, Marcos Sanmartín Fernández
Hospital Ribera POVISA, Vigo, Spain

Introduction: Trapezectomy has proven effectiveness in trapeziometacarpal arthritis although most patients experience decrease in strength and dexterity in the 2 first years.Scheker dynamic replacement arthroplasty is an alternative for the treatment of symptomatic rhizarthrosis, it reduces pain and improves ranges of mobility. Using the half of the Flexor Carpi Radialis tendon, we can reinforce the intermetacarpal ligament, and interpose tissue in the intermetacarpal space and in the room left by the trapeziectomy.

Aim: The main objective is analyze the subjective and objective results in patients suffering from trapeziometacarpal arthrosis after surgical treatment with the Scheker technique and, secondarily, analyze the number of intra and postoperative complications.

Material & Methods:From March 2007 to March 2024 we performed the procedure on 148 thumbs (15 performed bilaterally). This is a retrospective and longitudinal study where the T-student was used to compare preoperative and postoperative data. We reviewed general demographic , subjective and objective variables and complications.

Results: 148 patients (155 hands) were evaluated. The average follow up was 6,62 [0,41-17,66] years, 89% were women and 11% were men. The average age was 62,8 $\pm$ 11,7 years. Cases with primary osteoartrhritis were classified as Eaton II in 17%, Eaton III in 53% and Eaton IV in 30% of cases. We also included 10 patients with previous failed trapeziometacarpal prosthesis (2) and failed trapeziometacarpal arthrodesis (8).

Pain at rest, with exertion and DASH improved with statistically significant results ($p<0.01$, $p<0.01$ and p:0,029 respectively). There were no statistically significant differences between pre and postoperative range of motion ((Kapandji (p: 0,616), radial deviation (p: 0,317) and palmar deviation (p:0,285)), although 93% of patients reported better subjective postoperative motion. We also did not find statistically differences between pre and postoperative grip (p: 0,465), frontal (p:1) and lateral pinch strenght (p:0,157), but more than 81 % of the patients reported subjective improvement of strength after the intervention.

38,5 % of cases had surgical complications and some patients suffered more than 1 minor complication. From these ones 13,43% were intraoperatively , 17,91% were early complications (in the first 2 months), and 68,65 % were late complications (2 months after the surgery). After 2 months, FCR tendonitis were 85 % of the late complications but only 7 needed distal tenotomy.

Conclusions: Most intraoperative complications occurred harvesting the FCR tendon.

Early complications were primary related to Radial Sensory Nerve neuropathy, most probable because of the inflammation and cast or orthosis pressure. Our study has shown a high incidence of Flexor Carpi Radialis tendonitis although just the 18% of them needed surgical treatment. Patients should be warned about this potential complication knowing that distal tenotomy was effective when spontaneous resolution of the symptoms did not happen.

A-0423 A FLUOROSCOPIC TECHNIQUE FOR SAFELY PLACING THE DISTAL VOLAR LOCKING PLATE SCREWS INTO THE SUBCHONDRAL ZONE OF A DISTAL RADIUS FRACTURE USING A 45° SUPINATION OBLIQUE VIEW

Che Ho Lee[1], Bong Cheol Kwon[2],
[1]Hallym University Dongtan Sacred Heart Hopsital, Hwaseongsi, South Korea; [2]Hallym University Sacred Heart Hospital, Anyangsi, South Korea;

Introduction: A careful distal locking screw insertion into the subchondral zone is necessary to obtain a proper mechanical strength of the construct in volar locking plating for unstable distal radius fractures. But subchondral zone screw insertion increases the risk of intra-articular screw penetration, which may go un-recognized during surgery because of complex geometry of the distal end of radius

Aim: The purposes of this study were to evaluate the role of fluoroscopic guidance with 45° supination oblique view technique for placing the distal screws into subchondral zone during volar locking plating for unstable distal radius fractures and to explore the factors associated with poor screw placement

Material & Methods: We retrospectively analyzed 171 wrists of 169 patients treated with variable-angle volar locking plate for unstable distal radius fractures. A subchondral zone was defined as the metaphyseal area within 4mm from the articular margin of distal radius. The location of distal locking screws and radiographic parameters including teardrop angle were measured using computed tomography scan and X-rays. Clinical and radiographic factors were examined for possible association with screw placement failure

Results: Of 581 distal screws inserted, 559 screws (96.2%) were inserted into subchondral zone and 17 screws into the metaphyseal zone (2.9%). Five screws (0.7%) in three wrists showed intra-articular placement; four screws were placed into lunate fossa and one into scaphoid fossa. These three wrists also showed significantly decreased teardrop angle. The distal screws were significantly closer to the joint line in the lunate fossa than the scaphoid fossa (1.9 ± 0.9mm vs. 2.8 ± 1mm, $P < 0.000$)

Conclusions: The use of fluoroscopy-guided screw insertion technique is useful to safely place the distal locking screws into the subchondral zone. However, decreased teardrop angle or extended lunate fossa should be corrected before the distal screw insertion to avoid intra-articular screw placement.

A-0424 COMPARISON OF WRIST JOINT MOTIONS BETWEEN DOMINANT AND NON-DOMINANT HAND DURING ADL TASKS USING BOTH UPPER LIMBS

Sumire Tamemoto[1], Shota Date[1], Yuki Yamamoto[2], Hiroshi Kurumadani[1], Toru Sunagawa[1]
[1]Graduate School of Biomedical & Health Sciences, Hiroshima University, Hiroshima, Japan; [2]Department of Rehabilitation Technology, Hiroshima City Rehabilitation Hospital, Hiroshima, Japan

Introduction: Oblique motions of the wrist, which combine extension/flexion and radioulnar deviation, are referred to as the dart-throwing motion (DTM) when moving from radial extension to ulnar flexion and as the reverse DTM (rDTM) when moving from ulnar extension to radial flexion. Previous studies have shown that DTM and rDTM are used in various activities of daily living (ADL), such as hammering, drinking, and throwing a ball. However, most of these studies focused on wrist motions in the unilateral upper extremity, particularly on the dominant hand, and therefore it remained unclear that the wrist motions of the dominant and non-dominant hands during ADL using both upper extremities.

Aim: This study aimed to compare the proportions of DTM and rDTM between the dominant and non-dominant hands during ADL tasks using both upper extremities and to characterize the wrist motion of each hand.

Material & Methods: Twenty healthy, right-handed adults participated in this experiment and performed eight ADL tasks: (1) eating food in a bowl with chopsticks, (2) washing a dish with a sponge, (3) twisting and opening a bottle cap, (4) holding an object and cutting it with a kitchen knife, (5) rubbing their back with a towel, (6) Putting on a sock, (7) tying their shoelace, and (8) buttoning a shirt. Wrist motions during the tasks were measured using a flexible electrogoniometer with a twin-axis sensor. The device recorded the relative angles of extension/flexion and radioulnar deviation. From each angle, we calculated the tilt of the wrist motion. The tilt data were categorized into four directions (extension/flexion, radioulnar deviation, DTM, and rDTM), and then proportions of each direction were calculated. The proportions were compared between the four directions and between the dominant and non-dominant hands.
Results: DTM or rDTM proportions were the highest for all tasks, regardless of hand dominance, and were significantly higher than those of flexion/extension and radioulnar deviation. For tasks (1) eating and (2) washing a dish, while the dominant hand showed a significantly higher DTM proportion than the non-dominant hand, the non-dominant hand showed a significantly higher rDTM proportion than the dominant hand. Conversely, for tasks (3) opening a bottle cap and (4) cutting, the non-dominant hand showed a significantly higher DTM proportion than the non-dominant hand, whereas the dominant hand had a significantly higher rDTM proportion than the dominant hand. For other four tasks, the DTM or rDTM proportion were not significantly different between the dominant and non-dominant hands.
Conclusions: Wrist motions of each hand were task-dependent. For ADL tasks requiring distinct motions from each hand, opposite wrist directions were necessary: when the dominant hand had a higher DTM proportion, the non-dominant hand exhibited a higher rDTM proportion, and vice versa. To reacquire a functional wrist motion in the postoperatively, not only DTM but rDTM mobility is important, regardless of the injured hand side.

A-0425 EVALUATING THE SUBJECTIVE IMPACT OF CONTRALATERAL C7 TRANSFER ON NON-ARM FUNCTIONS IN HEMIPLEGIC STROKE SURVIVORS

Uk Hur[1], Yohan Lee[1,2], SeongJu Choi[3], Joonha Lee[4], Se Hee Jung[5,6], Sang Soo Kim[7]
[1]SMG-SNU Boramae Hospital, Seoul, Republic of Korea; [2]Seoul National University College of Medicine, Seoul, Republic of Korea; [3]Eulji University, Seoul, Republic of Korea; [4]Yeson Hospital, Seoul, Republic of Korea; [5]SMG-SNU Boramae Hospital, Seoul, Republic of Korea; [6]Seoul National University College of Medicine, Seoul, Republic of Korea; [7]KimSangSoo Micro Clinic, Seoul, Republic of Korea

Introduction: Contralateral C7 (CC7) root transfer is an effective treatment for spastic arm paralysis caused by cerebral hemisphere injury. However, there are no reports on the relationship between CC7 transfer and symptoms in areas other than the upper extremity.
Aim: This study aims to evaluate the functional recovery in non-upper extremity areas after CC7 transfer.
Material & Methods: A retrospective review was conducted on all patients with hemiplegia who underwent CC7 transfer at a single institution over two years. Comprehensive functional recovery—including gait, vision, urination, and speech—was assessed based on patients' reports of their disabilities. The evaluation was grounded in the patients' subjective statements regarding their recovery.
Results: Seventy-seven hemiplegic patients underwent CC7 transfer between 2017 and 2019 to restore upper extremity function. All patients reported improvement in upper extremity function. Among the 77 patients with walking difficulties, 60 (78%) experienced improved gait function. Of the 39 patients with vision problems, 33 (85%) noted some improvement. Among the 44 patients with speech issues, 34 (77%) reported improved speaking ability. Of the 40 patients with urination problems, 22 (55%) saw improved symptoms. Most functional improvements were significant within two weeks post-surgery and continued for up to a year.

Conclusions: CC7 transfer in hemiplegic patients resulted in subjective improvements in functions beyond the upper extremities. Further studies are needed to explore the comprehensive effects of CC7 transfer in hemiplegia.

A-0426 HUMERAL SHAFT ASEPTIC NONUNIONS MANAGEMENT IN A TERTIARY TRAUMA CENTER

Efstathios Konstantinou[1], Efstratios Athanaselis[1], Eleftheria P Adaktylidou[1], Alexandros Koskiniotis[1], Theodoros Mylonas[1], Nikolaos Stefanou[1], Zoe Dailiana[1,2], Michael Hantes[1], Socratis Varitimidis[1]
[1]Department of Orthopaedic Surgery, Faculty of Medicine, University of Thessally, Larissa, Greece; [2]Hand and Upper Extremity Surgery & Microsurgery Clinic, IASO Thessalias, Larissa, Greece

Introduction: The management of humeral fractures, whether surgical or non-surgical, typically results in excellent outcomes, with fracture healing recorded in over 90% of cases. However, nonunion of humeral shaft fractures is a challenging complication.
Aim: The aim of this study is to present epidemiological data, identify risk factors for nonunion, and evaluate the outcomes of surgical intervention in managing this challenging condition.
Material & Methods: From 2002 to 2022, a retrospective review was conducted involving 57 patients who underwent operative treatment for humeral nonunion. The diagnosis was confirmed through clinical and radiological evaluation at least 24 weeks post-injury or postoperatively. Fracture healing and functional outcomes were documented at the final follow-up.
Results: The study included 13 males (22.9%) and 44 females (77.1%), with a mean age of 56 years (range: 15-83). The most common location involved the right upper limb (38 cases), with 61.4% of fractures affecting the dominant arm. The interval from the initial surgery or injury to diagnosis averaged 8.4 months (range: 3-36). Nonunion healing was observed in all cases after an average of 3.91 months (range: 2.5-5.1). Nonunion after nonoperative treatment was predominantly associated with transverse fractures, whereas postoperatively, the primary cause was hardware failure due to inadequate rigidity of the construct, followed by cases of septic nonunion. Notably, improved outcomes were observed in patients treated with larger femoral plates for humeral fixation, contributing to a higher rate of fracture union and better functional recovery. Postoperatively, all patients were satisfied, with 73.6% achieving an excellent DASH score (<5) and 19.2% a "good" DASH score (<13). Radial nerve palsy was observed in 6 patients (10.5%) and superficial infection in 5 patients (8.7%). Four out of six patients with radial nerve palsy underwent nerve exploration within 3-6 months.
Conclusions: Humeral nonunions represent demanding surgical cases. Open reduction and internal fixation (ORIF) with autologous bone grafting remains the treatment of choice for most cases. Using larger plates than those typically proposed for the humerus may achieve better stability. Surgeon's expertise is a prerequisite for low rates of complications.

A-0427 OPERATIVE MANAGEMENT OF RADIAL TUNNEL SYNDROME: INSIGHTS FROM A HAND AND UPPER EXTREMITY CENTER

Efstathios Konstantinou[1], Nikolaos Stefanou[1], Alexandros Koskiniotis[1], Theodoros Mylonas[1], Efstratios Athanaselis[1], Zoe Dailiana[1,2], Socratis Varitimidis[1]
[1]Department of Orthopaedic Surgery, Faculty of Medicine, University of Thessally, Larissa, Greece; [2]Hand and Upper Extremity Surgery & Microsurgery Clinic, IASO Thessalias, Larissa, Greece

Introduction: Radial tunnel syndrome (RTS) is an uncommon compressive neuropathy involving the posterior interosseous nerve (PIN), characterized primarily by pain in the proximal forearm without motor deficits. This condition is often

misdiagnosed due to overlapping symptoms with lateral epicondylitis and other neuropathies. While initial management typically involves nonoperative methods, these approaches often fail, necessitating operative intervention for symptom relief.
Aim: The purpose of this study is to document the outcomes of operative management in patients with persistent symptoms of radial tunnel syndrome who did not respond to nonoperative treatment.
Material & Methods: Between 2010 and 2021, a total of 28 patients (12 men, 16 women) with an average age of 52 years (range: 27-62) underwent the anterior Henry approach for radial nerve decompression after unsuccessful nonoperative treatment for up to 6 months. Among these patients, 78.5% (22 out of 28) had surgery on their dominant arm, with no history of other neuropathies, while 4 patients had a history of epicondylitis. None of the patients demonstrated muscle weakness in the extensors or paresthesias in the distribution of the superficial branch of the radial nerve.
Results: No apparent causes of nerve compression, such as lipomas, ganglia, or synovial chondromatosis, were identified. Decompression of the radial nerve was carried out at all potential compression sites, including fibrous bands near the radial head, vascular loops of the radial recurrent artery, the arcade of Frohse, and the supinator muscle, as well as just proximal to the nerve's bifurcation into its branches at the elbow (posterior interosseous, supinator, and superficial branches). The mean postoperative follow-up period was 59.2 months. Postoperatively, none of the patients exhibited neurological symptoms, and all returned to work or sports activities within 2 months. According to the Roles and Maudsley criteria, 24 out of 28 patients (85%) had good to excellent outcomes.
Conclusions: Radial tunnel syndrome is a rare compressive neuropathy with distinct symptoms that must be carefully differentiated from other elbow-related conditions. Operative treatment, following the failure of nonoperative management, shows excellent results, particularly in the absence of concomitant upper limb pathologies.

A-0428 DELAYED UNION HOOK OF THE HAMATE FRACTURES, SURGICAL TREATMENT WITH PERCUTANEOUS FIXATION

Cristobal Greene[1,2,3], Alejandro Opazo[1], Marisol Marti[1,4], Arturo Verdugo[1]
[1]Clinica MEDS, Santiago, Chile; [2]Universidad Diego Portales, Santiago, Chile; [3]Hospital DIPRECA, Santiago, Chile; [4]Hospital FACH, Santiago, Chile

introduction: Acute fractures of the hamate hook can be effectively treated with casting, but initial evaluation typically occurs five to ten months after injury, limiting the success of immobilization. In these cases, surgical osteosynthesis offers a favorable alternative to symptomatic union resection, which may impair grip strength and lead to greater postoperative discomfort.
Material and Metods: This study presents the surgical team's experience treating hamate hook fractures using a percutaneous technique, involving a guide pin inserted volarly and a cannulated screw placed dorsally. We report on 18 cases, with an average patient age of 37 years and an average time of 75 days from injury to surgery. Ten cases were initially treated with casting or orthosis, without achieving consolidation.
Results: Most fractures resulted from falls on an extended hand; other mechanisms included stress fractures (3 cases), bicycle falls (3 cases), and a motorcycle fall (1 case). Bone consolidation was evaluated using wrist CT and clinical assessment. The technique, previously presented at the European Congress in Milan, achieved consolidation in all cases, with an average consolidation time of 68 days. One case was evaluated via X-ray rather than CT and showed favorable, asymptomatic consolidation.
Three cases required more than six weeks for consolidation, with durations of 212, 185, and 133 days; in the 212-day case, shockwave therapy was used as a complementary treatment. Two cases experienced transient postoperative ulnar neuritis, which resolved completely without motor impairment.

Conclusion, percutaneous osteosynthesis of the hamate hook is an effective treatment for non-displaced fractures with delayed consolidation or non-union, demonstrating a high consolidation rate with minor, reversible complications.

A-0429 BIOMECHANICAL PROPERTIES OF ADDING A MASSACHUSETTS GENERAL HOSPITAL TECHNIQUE TO PULVERTAFT WEAVE: A FRESH-FROZEN CADAVERIC STUDY

Jae-Yong, Cho, Hyun-Kyo, Kim, Won-Taek, Oh, Il-Hyun, Koh, Yun-Rak, Choi
Department of Orthopaedic Surgery, Yonsei University College of Medicine, Severance Hospital, Seoul, Republic of Korea

Introduction: The ideal goal of tendon reconstruction construct is to achieve secure fixation that allows early mobilization and to minimize bulk to decrease friction.
Aim: This study aimed to evaluate the biomechanical benefits of adding sutures with the Massachusetts General Hospital (MGH) technique to the Pulvertaft weaves.
Material & Methods: Thirty-six flexor digitorum profundus were harvested from 6 fresh-frozen cadaveric hands, and randomly allocated into two groups: Group P (Pulvertaft weave only, n=18) and Group M (Pulvertaft weave with additional MGH technique, n=18). The maximum and minimum widths, as well as the cross-sectional area (CSA), of the native tendons and constructs were measured. The native CSA was normally distributed and demonstrated no significant differences between the groups ($p > 0.05$). Load to failure (N), stiffness (N/mm), tensile strength (N/mm2), and elongation at failure (%) were measured with a tensile testing machine, and mode of failure were also assessed.
Results: There was no significant difference in CSA between the two groups. Regarding biomechanical properties, group M showed significantly higher load to failure (174.0 vs. 112.3 N, $p < 0.001$), stiffness ($p = 0.001$), and tensile strength ($p < 0.001$), with reduced elongation at failure ($p = 0.004$). Regarding the mode of failure, group P exhibited only intra-construct failures, such as suture failure or tendon pullout, whereas group M showed a statistically significant increase ($p=0.001$) in extra-construct tendon failures.
Conclusions: The addition of MGH sutures to Pulvertaft weaves demonstrated significantly higher stiffness and load to failure without increasing bulk.

A-0432 PREDICTIVE AND CUT-OFF VALUES OF PREOPERATIVE COMPOUND MUSCLE ACTION POTENTIAL AMPLITUDE IN RECOVERY OF INTRINSIC RECOVERY FOLLOWING SURGERY FOR CUBITAL TUNNEL SYNDROME

Jae-Yong, Cho, Hyun-Kyo, Kim, Won-Taek, Oh, Il-Hyun, Koh, Yun-Rak, Choi
Department of Orthopaedic Surgery, Yonsei University College of Medicine, Severance Hospital, Seoul, Republic of Korea

Introduction: Cubital tunnel syndrome (CuTS) is the second most common compression neuropathy in the upper extremities. However, the limited evidence regarding objective diagnostic tests and reliable treatment algorithms makes it challenging to identify the optimal surgical procedure for CuTS and establish standardized indications for SETS.
Aim: This study aimed to evaluate the predictive and cut-off values of preoperative compound muscle action potential (CMAP) amplitude for surgical outcomes in idiopathic cubital tunnel syndrome.
Material & Methods: A retrospective study was conducted on patients who underwent ulnar nerve transposition between January 2011 and July 2022 with a minimum of 24 months of follow-up. The primary outcome was the Medical Research Council (MRC) muscle strength of the abductor digiti minimi, and poor intrinsic function was defined as an MRC grade of 2 or lower at the final follow-up or a grade lower than the baseline. Secondary outcomes included the key pinch strength

ratio, grip strength ratio, and patient-reported outcomes. Statistical analyses were performed to identify factors associated with postoperative outcomes, and a receiver operating characteristic (ROC) curve was used to determine the cut-off value of preoperative CMAP amplitude for predicting poor intrinsic function.
Results: Of the 79 patients, 11 (14%) exhibited poor intrinsic function, which was independently associated with CMAP amplitude. The ROC curve analysis revealed a CMAP cut-off value of 6.15 mV (area under the curve 0.83, sensitivity 100%, specificity 71%). Additionally, among patients with a CMAP amplitude less than 6.15 mV in the subgroup analysis, age was the only factor significantly higher in the poor intrinsic function group compared with the good intrinsic function group.
Conclusions: Low preoperative CMAP amplitude was independently associated with poor postoperative intrinsic function in idiopathic cubital tunnel syndrome, with a cut-off value of 6.15 mV.

A-0437 CLINICAL AND RADIOGRAPHIC OUTCOMES OF METACARPOPHALANGEAL JOINT PYROCARBON ARTHROPLASTY FOR OSTEOARTHRITIS

Seungyong Sung, Sanghee Kim
Catholic Kwandong Univ. Medical school, International St. Mary's Hospital, Incheon, South Korea

Introduction: Advanced osteoarthritis affecting the metacarpophalangeal (MCP) joint may warrant arthroplasty.
Aim: To analyze postoperative outcomes in patients who underwent MCP arthroplasty using a pyrocarbon prosthesis for osteoarthritis.
Material & Methods: 24 MCP joint pyrocarbon arthroplasties in 20 patients with minimum 5 years of follow-up were reviewed. The mean age was 63 years. The primary operative indication was pain and stiffness from osteoarthritis refractory to nonsurgical management.
Results: At a mean follow-up of 5 $\pm$ 2 years, 2 cases had progressive implant instability because of grade 3 or greater loosening and underwent revison surgery. Postoperative complications occurred in 4 (18%) fingers and included ligament/tendon rupture (n=2) and instability (n=2). There was significant postoperative improvement in pain levels, MCP arc of motion, pinch strength, and grip strength. The mean subsidence was 0.1mm in the distal implant and 0.18mm in the proximal implant at the last follow-up
Conclusions: Arthroplasty in advanced MCP joint arthritis is a good surgical option with excellent clinical outcomes and cosmetic satisfaction, although diverse postoperative complications should be considered.

A-0441 FASCIAL EPICONDYLAR AUGMENTATION IN CASES OF CUBITAL TUNNEL SYNDROME WITH ULNAR NERVE INSTABILITY

Iveta Beinarovica, Martins Kapickis, Uldis Krustins
The Microsurgery Centre of Latvia

Introduction: Cubital tunnel syndrome (CubTS) is one of the most common traction-compression neuropathies in the upper extremity. The gold standard is simple in situ decompression with revision of potential compression sites through skin incision as small as rationally possible. Ehere is a subclass of patients with symptoms of CubTS that have ulnar nerve instability (UNI) with subluxation of the nerve over the medial epicondyle where conservative treatment would not be successful. Currently, the most popular surgical reconstruction for clinically relevant UNI is anterior transposition of the nerve. We propose ulnar nerve stabilization with fascial epicondylar augmentation so the nerve stays in its orthotopic position.

Aim: The objective of this study is to assess the outcomes following fascial epicondylar augmentation.
Material & Methods: Since 2018, a total of 113 surgeries for facial epicondylar augmentation have been conducted. This study included 92 hands that underwent at least two follow-up evaluations, which occurred no sooner than one year post-surgery.
Results: The average age of the patients in this study was 49 years, with an age range of 22 to 78 years. The gender distribution was comprised of 36% females and 64% males. A triceps medial head resection was performed in 81% of the cases. Improvement in symptoms and grip strength was observed in 86 of the 92 hands assessed (93%). Six patients continued to experience persistent symptoms, and ultrasound studies indicated subluxation of the ulnar nerve. Consequently, for these six patients, a submuscular transposition was performed as a salvage procedure, which resulted in subjectively satisfactory outcomes
Conclusions: Fascial epicondylar augmentation has demonstrated encouraging outcomes. Fascial epicondylar augmentation had shown promising results. With the proposed technique, the nerve remains in an orthotopic position, the segmental vascularity of ulnar nerve is preserved, innervation to the flexor carpi ulnaris muscle is not jeopardized, and ulnar nerve glide-floss exercises are possible as opposed to the standard subcutaneous transposition technique. Notably, the technique does not involve subfascial transposition, slings, or blocking flaps for nerve stabilization, as these approaches are deemed inconsistent with the principles of nerve release surgery.

A-0442 THE DIFFERENCES IN FINGER JOINT MOVEMENTS BETWEEN THE DOMINANT AND NON-DOMINANT HANDS DURING BUTTONING TASK

Sumire Tamemoto(1), Yasuharu Koike[2], Shota Date(1), Hiroshi Kurumadani(1), Toru Sunagawa(1)
[1]Graduate School of Biomedical & Health Sciences, Hiroshima University, Hiroshima, Japan; [2]Institute of Integrated Research, Institute of Science Tokyo, Tokyo, Japan

Introduction: In cases of hand injury, performing fine motor tasks with the fingertips often becomes challenging. Among these tasks, buttoning a shirt is particularly difficult activities for patients because it requires both bimanual coordination and precise fingertip control. While previous studies have analyzed the range of motion of the metacarpophalangeal (MCP) joints in the dominant hand during the buttoning tasks, no study analyzes the distal interphalangeal (DIP) joint movement during buttoning. Additionally, there has been no research examined the differences in finger joint movements between the dominant and non-dominant hands in the buttoning task.
Aim: This study aims to investigate the differences of finger joint movements, including the DIP joint, between the dominant and non-dominant hand during the buttoning task.
Material & Methods: We conducted a buttoning and unbuttoning task on a shirt with both hands, involving 18 right-handed healthy adult males. A magnetic motion tracker was used for motion analysis, with magnetic sensors attached to eight locations: the distal phalanx, proximal phalanx, and metacarpal of the thumb; the distal, middle, and proximal phalanges, and metacarpal of the index finger; and the distal end of the radius. The angles between adjacent sensors were analyzed to calculate the change in flexion angle during the task at seven joints—the thumb interphalangeal (IP) joint, thumb MCP joint, thumb carpometacarpal (CM) joint, index finger DIP joint, index finger proximal interphalangeal (PIP) joint, index finger MCP joint, and wrist joints. The change in angle at each joint was calculated during the buttoning and unbuttoning phases of the task, respectively, and compared between dominant and non-dominant hands.
Results: During the buttoning phase, the flexion angles of the thumb MCP joint and the index finger PIP and MCP joints were significantly larger in the dominant hand than those in the non-dominant hand. For the index finger DIP joint,

flexion was smaller in the dominant hand in the first half of the task, while the non-dominant hand showed significantly larger flexion. In the second half, flexion in the non-dominant hand became smaller, while flexion in the dominant hand became significantly larger. No significant differences were found between the hands for any other joints. During the unbuttoning phase, the flexion of the thumb MCP joint in the dominant hand was significantly larger than in the non-dominant hand, whereas the thumb IP joint showed significantly larger flexion in the non-dominant hand than in the dominant hand. No significant differences were observed for any other joints

Conclusions: It was suggested that buttoning requires a larger flexion angle in the dominant hand than in the non-dominant hand. Additionally, flexion and extension movements of the DIP joints of both hands could play an important role during buttoning.

A-0443 TURKISH RELIABILITY AND VALIDITY OF THE BRACHIAL PLEXUS PROFILE ACTIVITY SHORT FORM IN CHILDREN WITH BRACHIAL PLEXUS BIRTH INJURY

Zeynep Hosbay[1], Gülsena Utku Umut[1], Ahmet Koçyiğit[2], Müberra Tanrıverdi[3], Atakan Aydın[4]

[1]Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Biruni University, İstanbul, Turkey; [2]Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Zonguldak Bülent Ecevit University, Zonguldak, Turkey; [3]Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Bezmialem Vakıf University, İstanbul, Turkey; [4]Department of Plastic and Reconstructive Surgery, Faculty of Medicine, İstanbul University, İstanbul, Turkey

Introduction: The BP-PRO activity SF is a 12-question form designed to determine activities of daily living in individuals with brachial plexus birth injury (BPBI) between the ages of 4 and 21, and can be used at all levels of injury

Aim: The purpose of this study was to investigate its reliability and validity of the Turkish version of the BP-PRO activity SF in children with BPBI

Material & Methods: The original "Brachial Plexus Birth Palsy – Profiles / Activity Short Form version 2.0 (Parent/Caregiver Report)" was translated into Turkish by three researchers, and a single consensus version was created. This Turkish version was then back-translated into English by a native speaker, and reviewed by a committee alongside the original form. After linguistic corrections and cultural adaptations, the final Turkish version was prepared for use. The study included 60 children (42.1% girl, 57.9% boy; mean age=12.18±3.49) with BPBI and their parents. According to the types of involvement, 36.8% of the children were classified as C5-6, 28.1% of the children were classified as C5-7, and 35.1% of the children were classified as C5-T1. All children were evaluated twice (baseline and 1 week later) by the same physiotherapist for the reliability analysis. The Pediatric Outcomes Data Collection Instrument (PODCI) was used for the validity analysis

Results:The reliability of the first and second measurement scores of BP-PRO activity SF was high (ICC: 0.874; 95% confidence interval: 0.82-0.91 ICC: 0.880; 95% confidence interval, 0.82-0.92 respectively). Concurrent validity was found to be negative, moderate, and significant in the first measurements between BP-PRO activity SF and PODCI; and was confirmed to be negative, high, and significant correlation in the second measurement.($r=-0.696$, $p<.001$; $r=-0741$, $p<.001$, respectively)

Conclusions: Our results showed that the Turkish version of the BP-PRO activity SF form is valid and reliable. It is considered to be suitable for the evaluation of upper extremity functionality in daily life in Turkish children with BPBI. It is recommended for use by researchers and clinicians to better understand patient/parent perceptions of function

Keywords: brachial plexus birth injury, patient-reported outcomes, reliability, validity

A-0445 HAND BURN CONTRACTURE RELEASE

Andrew GR Wu, Vigneswaran Nallathamby, Priya Tiwari, O-wern Low
Division of Plastic, Reconstructive & Aesthetic Surgery, Department of General Surgery, Ng Teng Fong General Hospital, Singapore

Introduction: rnContractures are a common sequela of burns, with significant functional and cosmetic impairment, especially if the hands and fingers were to be involved.
Aim: We present a case of a release of burn contracture of the webspaces using Wu's square flap method MatriDerm® to optimize outcomes.
Material & Methods: We combined two different modalities to improve outcomes in dealing with post-burn contractures — Wu's square flap method and MatriDerm® insertion to reduce scar contracture.
Results: We hope this innovation will spur further discussion and research into the use of dermal substitute in post burn contracture release in the hands and other areas with high mobility requirements.
Conclusions: While a larger number of cases are needed to better evaluate the outcomes, the combination of flaps with the placement of dermal substitutes within the wound can be considered in primary burn contracture release with satisfactory outcomes and minimal added cost.

A-0447 CASE OF PSEUDOEPITHELIOMATOUS HYPERPLASIA GROWTH OVER SKIN GRAFT

Andrew GR Wu, Tan Ying Shan Amarinda, Lim Jin Xi
Department of Hand and Reconstructive Microsurgery, Ng Teng Fong General Hospital, National University Health System, Singapore

Introduction: Pseudoepithelial hyperplasia (PEH) is characterized by hyperplasia of the epidermis and adnexal epithelium. It is a benign condition, closely mimicking squamous cell carcinoma. It is often found in the background of chronic wounds, ulcer, infection or inflammatory dermatitis.
Material & Methods: We present a rare case of PEH over a split thickness skin graft receipient site in a 68 year old male with a background of skin graft over soft tissue defect over his right trans-metatarsal amputation stump following a road traffic accident. The patient developed an exophytic lesion over the previously grafted site, which was excised and subsequently confirmed as PEH upon histopathological evaluationConclusions: This case highlights the occurrence of this rare entity over a skin grafted area, and the diagnostic challenges posed by PEH, particularly its ability to clinically and histologically mimic squamous cell carcinoma, and hence the importance to clinically differentiate the 2 entities to avoid unnecessary management.

A-0448 EXTENSOR TRIPLE-FLAP INTEGRATED TENOLYSIS (T-FIT): A PILOT STUDY OF 17 CASES

Lorenzo Costa[1], Thomas Giesen[2]
[1]Clinica Ars Medica, Gravesano, Switzerland; [2]Università della Svizzera Italiana, Lugano, Switzerland

Introduction: Hand and finger injuries often result in secondary reduced finger mobility due to scar tissue formation and adhesion in extensor structures. The literature regarding secondary surgery to address stiffness and to restore flexion is limited, and traditional extensor tenolysis, focuses only in the surgical release of adhesions of tendons and joints.
Aim: Adequate dorsal skin elasticity and tendon mobility are both crucial for optimal hand function, particularly for

finger flexion. This series explores an integrated approach, which combines extensor teno- or tenoarthrolysis and a triple dorsal flap (Hueston-Hueston-Hatchet), to restore dorsal elasticity and improving postoperative mobilization.
Material & Methods: From 2020 to 2024, 17 patients (10 males, 7 females) for a total of 18 fingers, were treated surgically for finger flexion deficits due to previous trauma (10 fractures, 5 tendon injuries, 2 crash injuries, 1 infection). Indications included finger flexion deficit exceeding an active and passive tip-to-palm distance of 2 cm, and failure of conservative treatments. Surgeries involved extensor tenolysis or tenoarthrolysis, followed by closure with three sequential dorsal flaps to facilitate tendon gliding and prevent re-adhesion. Assessments included post-surgical range of motion (ROM), grip strength, pain, and patient satisfaction at regular intervals. Follow-up was 14 months
Results: In our series of 17 patients outcomes were encouraging with a significant increase in range of motion (ROM) and a mean total gain of about 72° per finger (p-value > 0.05). This approach proved to be effective for all digital joints: mean gain for MCP, PIP and DIP joint was 45°, 56° and 14° respectively (p-value < 0.05). The most frequent complications encountered, although without functional consequences, were lag extensions with 5 minor cases (below 30°), and 2 moderate cases (at 40°). We reported one case of wound dehiscence, and in two cases an additional flexor tenolysis to improve active mobility was needed. In one case the three flaps were augmented with a intermetacarpal flap
Conclusions: The T-FIT approach showed promising results for restoring finger function after secondary stiffness, improving functional recovery. By integrating tenolysis with a structured dorsal flap sequence, this method provides new elasticity to the dorsal skin, allowing a better tendon gliding and a free finger movement, optimizing postoperative rehabilitation.

A-0449 AUDIT OF RECORD OF CORE OUTCOME MEASURE RECORDING AT CLINICAL REVIEW OF ADULT BRACHIAL PLEXUS INJURY (BPI) PATIENTS

A Kenny[1], S Carr[2], G Colgan[2], K Cronin[2], C Quinlan[2]
[1]Fiona Stanley Hospital, 11 Robin Warren Dr, Murdoch, Perth, WA 6150; [2]Department of Plastic Surgery, Mater Misericordiae University Hospital, Eccles Street, Dublin 7, Ireland

Introduction: There is no international consensus regarding which treatments are most effective for Traumatic Brachial Plexus Injuries (TBPI). In order to evaluate their clinical effectiveness, interventions must be comparable. A study by Miller et al, developed a Core Outcome Set (COS) for TBPI, aiming to reach international consensus on the minimum set of outcomes to measure and report in adult TBPI. Development of a COS has been shown to reduce heterogeneity of outcome reporting in other health conditions.
Delays in referral to specialist units are common for nerve injuries. Peripheral nerve surgeons report that the optimal time for brachial plexus reconstruction of closed injuries ranges from 3 to 5 months. In a study carried out in Ireland in 2011, the median time from initial injury to referral letter receipt at the national brachial plexus injury unit was 8.2 months.
Methods: We identified all outpatient attendances to the National Brachial Plexus Service at MMUH between February 2022 and 2024. We performed a retrospective analysis of healthcare professionals' documentation of the COS as outlined by Miller et al (2). The date of clinic and management (surgical vs non-surgical), and whether the core outcomes had been recorded, was extracted. Outcomes were subdivided by Tier 1 (voluntary movement, pain and carrying out daily routine), Tier 2 (emotional distress, ability to feel with the arm, ability to cope, and access to appropriate treatment) and post-surgical outcomes (loss of voluntary movement and worsening of pain/parasthesia).
Results: 34 patients visited the clinic a total of 146 times during the period examined.
All Tier 1 outcomes were reported in 5.15% of visits (n=7), partially reported in 83.82% (n=114), and none in 11.03% of visits to BPI clinic (n=15).

All Tier 2 outcomes were not recorded for any patient. They were partially reported in 42.65% (n=58) and none were reported in 57.35% of visits to BPI clinic (n=78).
65 clinic visits were post operative. All post operative core outcomes were reported in 9.09% of visits (n=5), partially reported in 69.09% (n=38) and none in 21.82% (n=12)
Time from injury to first clinic appointment was recorded. The average time from injury to 1st clinic appointment was 12.5 weeks, and the median was 9.5 weeks.
Conclusions: Tier 1 outcomes which were deemed 'critically important to all stakeholders' – patients, surgeons and MDT members - were only reported in full in 5% of TBPI clinic visits to MMUH. The service lacks homogenous outcome measurement and reporting, making comparison of the service to international standards, difficult. Clear, defined, outcome reporting is necessary in order to ensure the service is meeting international standards and to ensure the best outcomes for our patients.
The time from injury to first clinic has significantly improved from the previous Irish study, likely due to the online National Brachial Plexus Injury Referral Form, which was created after the 2011 study.
A novel method of outcome reporting for all TBPI patients is being trialled. Our service will then be re-audited, to assess for an improvement in core outcome reporting and facilitate international outcome comparisons.

A-0450 NERVE TRANSFERS IN UPPER EXTREMITY NERVE RECONSTRUCTION: AN ANALYSIS OF TREATMENT STRATEGIES OF UPPER EXTREMITY NERVE INJURIES BY PLASTIC AND ORTHOPEDIC SURGEONS

Jonathan L. Jeger[1], Pooja Dhupati[2], Shelley Noland[3]
[1]Division of Plastic and Reconstructive Surgery, Department of Surgery, Mayo Clinic Arizona, Phoenix, AZ, USA; [2]University of Arizona College of Medicine-Phoenix, Phoenix, AZ, USA; [3]Division of Hand Surgery, Department of Orthopedics, Mayo Clinic Arizona, Phoenix, AZ, USA

Introduction: Nerve transfers for upper extremity nerve injuries represent a novel treatment modality, which has gained popularity in recent years. Although both plastic and orthopedic surgeons are qualified to perform nerve transfers for upper extremity nerve reconstruction, their surgical training and reconstructive planning may differ.
Aim: This study aims to analyze upper extremity nerve reconstruction cases performed by plastic and orthopedic surgeons, which may guide surgical training objectives in both disciplines.
Material & Methods: Patients undergoing upper extremity nerve reconstruction performed by plastic or orthopedic surgeons were identified in the American College of Surgeons National Surgical Quality Improvement Program (2006-2022). Nerve transfer utilization trends were analyzed using Current Procedural Terminology (CPT) codes. A binary variable was introduced to further subdivide upper extremity nerve reconstructions into cases with nerve transfer(s) and cases without nerve transfers. Descriptive statistics analyzed patient demographics, morbidities and indications by International Classification of Diseases (ICD-10) code. Fisher's exact test, Chi-square test, and Wilcoxon rank sum test assessed associations. A subgroup analysis of nerve transfers was performed based on anatomic location of injury.
Results: A total of 2092 upper extremity nerve reconstruction cases performed by plastic or orthopedic surgeons were identified and included. 72% of cases were performed by orthopedic surgeons (N = 1498) and 28% by plastic surgeons (N = 594). Orthopedic surgeons performed nerve transfers in 66 out of 1498 cases (4.4%) while plastic surgeons performed nerve transfers in 59 out of 594 cases (9.9%). Plastic surgeons were significantly more likely to utilize nerve transfers in upper extremity nerve reconstruction compared to orthopedic surgeons (Odds Ratio = 2.39, $p < 0.001$). Patients undergoing nerve transfers by either type of surgeon had significantly higher estimated preoperative morbidity compared to patients undergoing reconstruction without nerve transfer ($p < 0.001$). Cases involving nerve transfers performed by either type

of surgeon had significantly longer operative times compared to cases without nerve transfers ($p < 0.001$). There was no difference in terms of overall postoperative complication rate ($p > 0.99$) or complication rate following nerve transfers specifically ($p > 0.99$) between plastic and orthopedic surgeons. Subgroup analysis showed that the most common indications for nerve transfers performed by orthopedic surgeons (N = 66) was ulnar nerve injury (58%), followed by wrist, hand or finger injury (15%). The most common indications among plastic surgeons (N = 59) was ulnar nerve injury (42%), followed by wrist, hand or finger injury, axillary nerve injury, and other arm injury (12% each).
Conclusions: Both plastic and orthopedic surgeons have adopted nerve transfers as part of their armamentarium for the treatment of upper extremity nerve injuries. Although orthopedic surgeons perform more upper extremity nerve reconstruction cases overall, plastic surgeons have a higher nerve transfer utilization rate in upper extremity nerve reconstruction. The observed difference may be associated with the amount of microsurgical teaching each specialty is exposed to during training. This finding may help guide surgical training objectives for aspiring hand surgeons.

A-0452 METACARPAL FRACTURE IN ATHLETES: PERCUTANEUS SCREW FIXATION

Massimo Massarella[1], Matteo Turchetta[1,2], Marianna Citro[1,2], Guglielmo Torre[1]
[1]Villa Stuart Sport Clinic, Rome, Italy; [2]Top Physio Clinics, Rome, Italy

Introduction: Metacarpal fractures are common in professional athletes and are often caused by trauma during high-intensity contact sports. Traditional fixation methods, such as Kirschner wires, plates, and screws, are effective but have limitations in terms of rehabilitation time and surgical invasiveness. Percutaneous antegrade intramedullary fixation with screws is an emerging technique for stabilizing metacarpal fractures, offering advantages in terms of rapid fracture stabilization and early mobilization.
Aim: The aim of this study was to evaluate the outcomes of percutaneous internal fixation of metacarpal fractures using intramedullary screws in a group of professional athletes, focusing on fracture healing time, functional recovery, and return to sport.
Material & Methods: A retrospective study was conducted on 24 professional athletes, of which 4 practiced boxing and 20 played football (average age 28 years, range 25-35 years), with acute fractures of the metacarpal neck (N = 4, boxing) and diaphyseal fractures (N = 20, football). The athletes were treated with percutaneous intramedullary fixation supplemented with Low-Intensity Pulsed UltraSound (LIPUS – Osteotron) at 30 days to stimulate bone growth. The fractures were classified according to the AO system. Follow-up assessments were performed at 30 days, 90 days, and 12 months, evaluating functional, clinical, radiological, and biomechanical outcomes, including range of motion (ROM), grip strength, pain levels, fracture healing time, and any complications. Return to sport was evaluated based on the athlete's ability to resume their previous sport activity without limitations.
Results: The functional, clinical, radiological, and biomechanical outcomes were favorable, with a full recovery of metacarpophalangeal joint ROM, restoration of grip strength to an average percentage of 87% that of the contralateral hand, a significant reduction in pain levels as measured by the VAS scale ($p<0.001$), and fracture healing achieved with an average time of about 40 days (from 4 to 8 weeks). In 98% of patients the degree of satisfaction was good or excellent. No cases of fixation failure, secondary fractures, tendon injuries, or rotational deformities were observed. One case of superficial infection was noted. Return to sport occurred within an average of 4 months for boxers and within an average of 2 months for football players.
Conclusions: Percutaneous antegrade fixation with intramedullary screws for metacarpal fractures in professional athletes was shown to be a safe, effective, and reliable method for fracture stabilization and early mobilization.

A-0453 THE EVOLUTION OF A PARADIGM SHIFT: THE ADOPTION OF NERVE TRANSFERS AMONG ORTHOPEDIC, PLASTIC AND NEUROSURGEONS

Pooja Dhupati[1], Jonathan L. Jeger[2], Sunny Vansdadia[1], Shelley Noland[3]

[1]University of Arizona College of Medicine-Phoenix, Phoenix, AZ, USA; [2]Division of Plastic and Reconstructive Surgery, Department of Surgery, Mayo Clinic Arizona, Phoenix, AZ, USA; [3]Division of Hand Surgery, Department of Orthopedics, Mayo Clinic Arizona, Phoenix, AZ, USA

Introduction: Nerve transfers represent a paradigm shift in peripheral nerve surgery, with distinct advantages over other nerve reconstruction techniques. However, their adoption across surgical specialties (orthopedic surgery, plastic surgery, and neurosurgery) is insufficiently studied.

Aim: To evaluate the adoption of nerve transfers among orthopedic, plastic, and neurosurgeons and to characterize specialty-specific variations in nerve reconstruction patterns and outcomes.

Material & Methods: Patients undergoing nerve reconstruction procedures were identified in the American College of Surgeons National Surgical Quality Improvement Program (2014-2022). Nerve transfer utilization trends were analyzed using Current Procedural Terminology (CPT) codes across specialties. To mitigate multiple codes in a single case, we introduced a binary variable indicating nerve transfer code presence. Cochran-Armitage tests assessed trends in proportions across year. Descriptive statistics analyzed patient demographics, morbidities and indications by International Classification of Diseases (ICD-10) code. Fisher's exact test, Chi-square test, and Wilcoxon rank sum test assessed associations ($p < 0.05$).

Results: 1,391 nerve reconstruction cases were recorded, distributed among orthopedic surgeons (53%), plastic surgeons (27%), and neurosurgeons (21%) ($p < 0.0001$). Nerve transfers were involved in 12% of cases, predominantly by plastic surgeons, who performed 56% of all nerve transfers. The utilization of nerve transfers increased significantly over time across all 3 specialties ($p < 0.05$). 25% of all nerve reconstruction procedures performed by plastic surgeons involved nerve transfers, a significantly higher rate compared to orthopedic surgeons (7.5%) and neurosurgeons (5.9%) ($p < 0.0001$). Nerve transfers were most common in brachial plexus repairs (19%) compared to lower extremity (6.5%) and upper extremity nerve injuries (11%) ($p < 0.0001$). No significant differences were found comparing postoperative complications or patient age. A subgroup analysis of nerve reconstruction in brachial plexus injuries ($N = 376$ cases) showed that although orthopedic surgeons performed a higher proportion of brachial plexus nerve injury procedures overall ($p < 0.001$), plastic surgeons had the highest utilization rate of nerve transfers within brachial plexus injury cases (62%), followed by orthopedic surgeons (28%) and neurosurgeons (9.9%). There was no significant difference in serious complications, but minor complication rates differed across specialties ($p = 0.0124$). With regards to preoperative morbidity index, plastic surgeons had a higher percentage of patients within the highest percentile compared to orthopedic surgeons and neurosurgeons

Conclusions: Our analysis reveals a substantial increase in the adoption of nerve transfers among orthopedic, plastic, and neurosurgeons. While orthopedic surgeons and neurosurgeons exhibited lower adoption rates compared to plastic surgeons, the proportion of overall nerve transfers significantly increased within each specialty between 2014 and 2022. With regards to brachial plexus nerve injury specifically, plastic surgeons had the highest utilization rate of nerve transfers.

A-0454 A DIFFERENT PERSPECTIVE ON ACUTE BOUTONNIÈRE DEFORMITY: AN ANATOMICAL STUDY AND CASE REPORT

Lorenzo Andrea Ferrazzini, Thomas Giesen
Universita della Svizzera Italiana, Lugano, Switzerland

Introduction: The role of central slip detachment and volar subluxation of the lateral bands is well recognised in the pathogenesis of chronic boutonnière deformity. However, the specific contributions of the triangular aponeurosis, retinacular ligaments, and collateral ligaments remain debated, as does the definition of acute boutonnière deformity.
Aim: to introduce a different perspective on acute boutonnière deformity
Material & Methods: Sixteen long fingers from four cadaveric hands were used to simulate complete detachment of the central slip (Group A) or longitudinal injuries to a single lateral band crossing the proximal interphalangeal (PIP) joint, with and without collateral ligament injury (Group B). For each finger, volar dislocation of the lateral bands during full passive finger flexion and potential reduction upon extension were recorded. Subsequently, a force of 10 N was applied to different extensor elements (intrinsic/extrinsic), individually and in combination, while documenting finger movement and the occurrence of any irreducible boutonnière deformity. Additionally, we report a clinical case of an irreducible acute boutonnière deformity caused by a longitudinal lateral band injury with concomitant collateral ligament detachment.
Results: Acute boutonnière deformity can be induced by a longitudinal injury to a single lateral band combined with collateral ligament detachment. Isolated central slip injury alone does not appear sufficient to cause an acute deformity.
Conclusions: This study demonstrates the potential for acute boutonnière deformity to arise from a longitudinal injury to a single lateral band combined with collateral ligament detachment. The diagnostic approach with ultrasound and the indications for systematic conservative treatment of these injuries appear to need reassessment.

A-0455 PSYCHOLOGICAL, SOCIAL AND FUNCTIONAL CHARACTERISTICS OF THORACIC OUTLET SYNDROME PATIENTS WITH CENTRAL SENSITIZATION SYMPTOMS

Şule Tüzen Tek[1], Tüzün Fırat[2]
[1]Graduate School of Health Sciences, Hacettepe University, Ankara, Turkey; [2]Faculty of Physical Therapy and Rehabilitation, Hacettepe University, Ankara, Turkey

Introduction: Central sensitization is a physiological process characterized by over-stimulation of the central nervous system, leading to structural changes in the descending pain modulation system and the pain neuromatrix. Neuroimaging studies have shown that in the presence of central sensitization, there are activation changes in limbico-cortical. These changes create maladaptive behavioural changes in patients by contributing to negative disease perception and coping strategies. In conclusion, central sensitization is one of the mechanisms associated with chronic pain. Therefore, the presence of central sensitization should be considered in treatment planning.
Aim: The aim of the study was to compare biological (pain intensity, sleep problems, functionality), psychological (depression, anxiety, stress, catastrophobia) and social parameters in thoracic outlet syndrome (TOS) patients with and without central sensitization.
Material & Methods: The study included 56 patients. Central sensitization of the patients was evaluated with the Central Sensitization Inventory. The cut-off value in the scale is 40. Resting and activity pain intensity of the patients were questioned with visual analog scale (VAS). Functional Evaluation of TOS: Self Questionnaire (FETOS), Depression, Anxiety and Stress Scale-21 (DASS-21), Perceived Social Support Scale, Jenkins Sleep Scale (JSS), Brief Illness Perception Questionnaire

(B-IPQ) and Pain Catastrophizing Scale scores were questioned. Patients' symptom duration was recorded in years. Mann Whitney-U test was used for comparison between groups.
Results: The mean age of the patients included in the study was 34.62±10.35. Central sensitization symptoms were present in 28 patients. There were significant statistical differences in the scores for JSS (p=0.001), DASS-21 Depression (p=0.014), DASS-21 Anxiety (p=0.000), DASS-21 Stress (p=0.006), FETOS (p=0.001), the Perceived Social Support Scale (p=0.014), VAS resting (p=0.036), and VAS activity (p=0.037) between patients with and without central sensitization. Symptom duration and PCS were statistically similar in patients with and without central sensitization (p=0.140).
Conclusions: Patients who were classified as centrally sensitized were found to have significantly worse functionality, psychological factors (anxiety, depression, anxiety), sleep disturbance and pain intensity. Depression, anxiety, stress level, sleep disturbance and pain severity may be predisposing factors for thoracic outlet syndrome. In addition, these patients had less perceived social support. It highlights the significant role of social support in pain management and overall well-being. Insufficient social support can exacerbate central sensitization symptoms and make it more difficult for patients to adhere to treatment. Therefore, strengthening social support systems can contribute to a better recovery process for patients.
The results indicate that central sensitization should be addressed with a multidisciplinary approach. Psychological support, enhancement of social support mechanisms, and individualized pain management strategies can improve the treatment process and quality of life for patients. The findings of this study can help clinicians better recognize central sensitization symptoms and adjust treatment plans accordingly.

A-0456 ARTHROSCOPIC TREATMENT OF SCAPHOLUNATE INTEROSSEOUS LIGAMENT INJURIES, A SYSTEMATIC REVIEW AND META-ANALYSIS

L.A. Rojer, J. Juttmann, N.W.L. Schep
Department of Hand and Wrist Surgery Maasstad Ziekenhuis, Rotterdam, The Netherlands

Introduction: Arthroscopic techniques for treating scapholunate interosseous ligament (SLIL) injuries have evolved over the past decade. However, the optimal arthroscopic surgical approach for varying grades of SLIL injuries remains debated Aim: To systematically review and meta-analyse clinical outcomes of arthroscopic interventions for SLIL injuries, providing evidence-based guidance for treatment selection based on the grade of SL injuries.
Material&Methods: A systematic literature search of PubMed and Embase was conducted on September 23, 2024, to identify primary studies reporting patient-reported outcomes following arthroscopic treatment of SLIL injuries, with a minimum postoperative follow-up of three months. Two reviewers independently screened articles, extracted data, and assessed study quality. A random-effects meta-analysis was performed to evaluate changes in patient-reported outcome measures, including the modified Mayo Wrist Score and the (Quick)DASH, comparing preoperative and postoperative values.
Results: Nineteen studies encompassing 548 patients met the inclusion criteria. Studies were categorized based on the arthroscopic technique employed. Meta-analysis of seven studies investigating arthroscopic capsulodesis (n = 123) demonstrated a significant improvement in patient-reported outcomes postoperatively compared with baseline (standardized mean difference [SMD]_within = 2.5; 95% confidence interval [CI]: 1.6 to 3.4). In contrast, four studies evaluating electrothermal shrinkage (n = 89) showed postoperative improvements that did not reach statistical significance (SMD_within = 1.4; 95% CI: −0.5 to 3.3).
Conclusions: Arthroscopic capsulodesis appears to offer significant functional improvement and a favorable safety profile, even in higher-grade SLIL injuries. These findings support its role as a reliable and effective treatment option in the arthroscopic management of SLIL pathology.

A-0457 INVESTIGATION OF FACTORS AFFECTING WELL-BEING IN PATIENTS WITH THORACIC OUTLET SYNDROME

Şule Tüzen Tek[1], Tüzün Fırat[2]

[1]Graduate School of Health Sciences, Hacettepe University, Ankara, Turkey; [2]Faculty of Physical Therapy and Rehabilitation, Hacettepe University, Ankara, Turkey

Introduction: The diagnosis of thoracic outlet syndrome (TOS) is delayed due to the common clinical symptoms, confusion with different pathologies involving the upper extremity and lack of standardized diagnostic methods. Therefore, TOS patients present as patients with chronic pain. Due to its multifactorial nature and the presence of different symptoms, the exact etiology of chronic pain is not known. Therefore, determining the factors affecting well-being in chronic pain may help to deliver appropriate treatment methods to the patient accurately and quickly.

Aim: The aim of the study was to determine the parameters affecting well-being in patients with TOS.

Material & Methods: The study included 56 patients. Patients' well-being was questioned with Pain Disability index and subjective well-being. For subjective well-being, patients were asked to rate their well-being on a scale of 0-10, with 0 representing too bad well-being and 10 representing too good well-being. In addition, Central Sensitization Inventory (CSI), Depression, Anxiety and Stress Scale-21 (DASS-21), Functional Evaluation of TOS: Self Questionnaire (FETOS), Jenkins Sleep Scale (JSS), Brief Illness Perception Questionnaire (B-IPQ) scores were questioned. Pain intensity during resting, activity and night were measured by using visual analog scale (VAS).

Results: The mean age of the patients included in the study was 34.62±10.35. There was a positive moderate correlation between Pain Disability Index and VAS activity (r:0.649, p=0.000), VAS night (r=0.584, p=0.000), VAS resting (r=0.420, p=0.001), FETOS (r=0.604, p=0.000). There was a weak correlation between Pain Disability Index and JSS (r=0.325, p=0.015), CSI (r=0.397, p=0.002), B -IPQ (r=0.266, r=0.048). There was a negative moderate correlation between subjective well-being and CSI (r=-0.471, p=0.000), stress level (r=-0.436, p=0.001). There was a negative weak correlation between subjective well-being and depression (r=-0.347, p=0.009), anxiety (r=-0.297, p=0.026), VAS activity (r=-0.314, p=0.018), VAS night (r=-0.335, p=0.012), FETOS (r=-0.291, p=0.035).

Conclusions: We found that both functional and psychological factors affect well-being in TOS patients. Subjective well-being was associated with depression, anxiety and stress level.

Thoracic outlet syndrome should not be considered only as a musculoskeletal injury but should be evaluated from a biopsychosocial perspective. Psychological factors such as depression, anxiety and stress, which have a bidirectional relationship with chronic pain, were associated with subjective well-being in contrast to PDI. The fact that these individuals are under the influence of chronic pain may suggest poor well-being. Low subjective well-being may limit the effectiveness of treatments. Therefore, for successful treatment outcomes, patients' psychosocial health should be taken into consideration and a treatment strategy should be determined with a multidisciplinary team approach.

As a consequence, these results suggest that the PDI is strongly associated with pain and functioning, while subjective well-being is influenced by psychological and physical stressors. The findings support that the PDI is a useful tool for clinical assessment and correlates with patients' general health status.

A-0458 CAPSULOPLASTY OF THE DORSAL CARPOMETACARPAL LIGAMENT COMPLEX BY ARTHROSCOPPY IN CARPOMETCARPAL INSTABILITY

Fabio Tandioy[1], Andrea Atzei[2], Lucian Marcovici[3], Riccardo Luchetti[4]
[1]Las Americas Clinic; [2]Pro-Mano, Hand Surgery and Rehabilitation, Treviso, Italy; [3]Hand&Microsurgery, Unit, Jewish Hospital of Rome,Rome, Italy; [4]Rimini Hand and Upper Limb Surgery & Rehabilitation Center, Rimini

Carpometacarpal (CMC) instability, caused by hypermobility, congenital disorders, or trauma, leads to pain and functional limitations. Ligament laxity reduces joint congruity, increasing stress on the joint. Initial treatment involves splinting and physical therapy to restore proprioception and strengthen muscles. Persistent pain requires ruling out osteoarthritis, even with normal X-rays, necessitating an MRI. The dorsal ligament complex is critical for CMC stability, and various repair techniques exist. Inspired by Birman's open procedure, we developed an arthroscopic capsuloplasty technique.
Aim: Wrist arthroscopic capsuloplasty is a minimally invasive technique to address CMC instability, aiming to reduce pain and restore function.
Material & Methods: This retrospective study involved CMC joint arthroscopy to assess cartilage integrity. If cartilage was intact, dorsal capsuloplasty was performed. Postoperative outcomes included evaluations of range of motion, grip strength, and pinch strength.
Results: Seven female patients (ages 37–54, average 41.6 years) were followed for an average of 21 months. Grip strength reached 95%, and pinch strength 92.5% compared to the contralateral hand. One transient dorsal radial nerve irritation was reported, which resolved within months.
Conclusions: Arthroscopic dorsal capsuloplasty is a safe and effective technique for CMC1 instability, offering enhanced visualization with minimal risks and tissue trauma.

A-0459 THE EARLY RESULTS OF ACUTE TENDINOUS MALLET FINGER AFTER SURGERY USING K-WIRE FIXATION AND TENDON REPAIR IN THE LOW COMPLIANCE PATIENTS

Ji-Won Lee, Woosik Pae, Myung-Jae Yoo
Trauma Micro Recontructive Orthopedic & plastic center, Goodgeon Hospital, Korea

Introduction: Traditionally the principle of tendinous mallet finger is conservative treatment using finger splint and brace. But it's not easy to maintain finger splint and brace for 8 weeks to make extensor tendon healing. In the meantime, there were many cases where the compliance of patient decreased and the conservative treatment failed in the end.
Aim: So, we investigated the clinical characteristics, functional outcomes and final extension lag of acute tendinous mallet finger after surgery. Furthermore, we compared the result of this study to other previous studies performed conservative treatment.
Material & Methods: Between June 2022 and July 2024, we reviewed the medical records of 25 patients who performed acute mallet finger operation within 1 week after injury. According to the location of extensor tendon rupture, we classified rupture pattern as 3 types(proximal, middle(DIP joint), distal) in the distal interphalangeal joint. During the surgery, all patients were performed to extensor tendon terminal slip repair depending on the rupture pattern. The repair was made with prolen, prolen plus vicryl and suture anchor respectively. We evaluated the distal interphalangeal joint final extension lag and range of motion.
Results: The classification of extensor tendon rupture location was proximal(n=10), middle(n=5) and distal(n=10). The ratio of man and female was 21 to 4 respectively. The mean age of patients was 47.8 yrs. The median follow up period

was 5.7 months. The fixation materials of repair were prolen(n=8), prolene plus vicryl augmentation(n=13), suture anchor(n=4). The average of K-wire fixation period was 7.7 weeks. As for functional outcome, the mean of the distal interphalangeal joint final extension lag was 3 degrees. Among the patients, the portion of normal extension degree was 15/25(60%). The estimated mean final distal phalangeal joint flexion was 61.6 degrees. During the final follow-up period, visual analogue scale(VAS) was 0.68.
Conclusions: Acute tendinous mallet finger operation within 1 week after injury is a useful method compared with conservative treatment. According to the pattern of rupture, repairing extensor tendon could be effective and improve distal interphalangeal joint extension and flexion in the low compliance patients

A-0460 THE LONG-TERM OUTCOMES OF LIGAMENT RECONSTRUCTION IN NON-TRAUMATIC THUMB CARPOMETACARPAL INSTABILITY: AN 8 YEAR FOLLOW-UP OF 177 PATIENTS

Niek J. Nieuwdorp[1]; Isabel C. Jongen[1]; Caroline A. Hundepool[1]; Mark J. W. van der Oest[1]; Thybout M. Moojen[2]; Ruud W. Selles[1,3]; the Hand-Wrist Study Group; J. Michiel Zuidam[1]
[1]Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [2]Hand and Wrist Center, Xpert Clinics, The Netherlands; [3]Department of Rehabilitation Medicine, Erasmus MC, Rotterdam, the Netherlands

Background: Ligament reconstruction for thumb carpometacarpal (CMC) instability remains controversial due to uncertainties regarding its long-term effectiveness and progression to osteoarthritis. Additionally, numerous surgical techniques exist, with the optimal approach still uncertain. The newer figure-of-eight technique, offering direct volar support, may offer a more rigid and durable stabilization compared to the more well-known Eaton-Littler ligament reconstruction, but long-term comparative studies are lacking.
Aim: This study aimed to assess the durability of ligament reconstruction in non-traumatic CMC instability and compare the long-term outcomes of the Eaton-Littler and figure-of-eight techniques.
Material & Methods: Patients undergoing ligament reconstruction for non-traumatic thumb CMC instability were considered eligible for inclusion into this prospective cohort study. Patients were excluded if they presented with connective tissue diseases or chondropathy of the STT or CMC joint. Patients were treated with either the Eaton-Littler or the figure-of-eight technique. The Eaton-Littler technique involves passing a flexor carpi radialis graft through a bone tunnel in the first metacarpal, while the figure-of-eight technique involves routing a palmaris longus graft in a figure-eight pattern through the first metacarpal and trapezium on the volar side of the joint. Pain and function were assessed at intake, 12 months, and over the long-term follow-up using the Michigan Hand Outcome Questionnaire (MHQ, 0-100). Secondary outcomes included patient satisfaction at long-term follow-up, and the number of patients needing treatment for persisting complaints.
Results: A total of 177 patients were included with a mean follow-up of 8 years. A total of 135 underwent the Eaton-Littler technique and 42 the figure-of-eight technique. Both techniques significantly improved MHQ pain (from 35 to 63) and function (from 53 to 70) at 12 months ($p < 0.001$). Trapeziectomy was performed in 5% of Eaton-Littler and 2% of figure-of-eight patients for progression to osteoarthritis. Among patients who did not require trapeziectomy, further improvements were seen in pain ($p = 0.002$) and function ($p < 0.001$) over long-term follow-up. At long-term follow-up, 86% of patients in the Eaton-Littler group was satisfied with the treatment result compared to 79% in the figure-of-eight group. After 12 months, 17% of the Eaton-Littler patients required treatment for recurrent issues, and 3% underwent reoperation. In the figure-of-eight group, 27% needed additional treatment, with 5% undergoing reoperation. No significant differences were observed between techniques.

Conclusions: The findings suggest that the controversy surrounding ligament reconstruction for non-traumatic CMC instability may be unwarranted. Few patients required trapeziectomy for osteoarthritis progression, while most showed long-term improvement in pain and function with high satisfaction. Both techniques proved effective and durable, with no significant differences.

A-0461 CLINICAL AND FUNCTIONAL OUTCOME OF 90 CARPOMETACARPAL PROSTHESIS DUAL MOBILITY

Massimo Massarella[1], Matteo Turchetta[1,2], Marianna Citro[1,2], Guglielmo Torre[1]
[1]Villa Stuart Sport Clinic, Rome, Italy; [2]Top Physio Clinics, Rome, Italy

Introduction: Although trapeziometacarpal arthroplasty (TMCA) implants do not show long-term functional superiority compared to trapeziectomy, the literature findings regarding tenoplasty techniques are controversial. Some evidence suggests that TMCA offers advantages such as shorter operating times and faster functional recovery.
Aim: The aim of this study was to evaluate the outcomes of TMCA implantation at an average follow-up of 22 months by evaluating functional and clinical outcomes.
Material & Methods: Retrospective study on 90 patients undergoing TMCA implantation (Touch® prosthesis, Kerimedical). The mean follow-up was 22 months evaluating functional and clinical outcomes, which included pre- and post- operative pain (VAS for pain), patient satisfaction rates (on a 5-point Likhert scale); complication and reoperation rates were also recorded.
Results: The VAS for pain was significantly reduced both at rest and during daily activities following the intervention ($p<0.001$ in both cases). The Kapandji test showed a complete recovery of the joint ROM of the thumb opposition. In 91.2% of patients, the degree of satisfaction was good or excellent. Three implant dislocations (3.3%) and five cases of De Quervain's tenosynovitis (5.6%) were recorded, which led to re-operation for revision or decompression of the first compartment of the extensors.
Conclusions: The TMCA with ball-and-socket geometry has proven to be a safe and stable implant, with a high degree of patient satisfaction and good functional outcomes. Given the high incidence of postoperative De Quervain tenosynovitis, decompression of the first extensor compartment during prosthesis placement could mitigate complication rates.

A-0462 LATE INJURY OF THE MOTOR BRANCH OF THE ULNAR NERVE FOLLOWING TRAUMATIC INSERTION OF A NAIL – CASE PRESENTATION

Christos Konstantinidis, Sotiris Plakoutsis, Vasileios Panagiotopoulos, Christos Kotsias, Charilaos Galanis, Alkisti Konstantinou, Nikolaos Vlachos, Dimitrios Tsiampas, Dimitrios Vardakas, Dimitrios Giotis
General Hospital of Ioannina, Ioannina, Greece

Introduction: Delayed ulnar nerve injuries are relative rare.
Aim: The aim of the study is to report a case of motor deficits in the distribution of the ulnar nerve due to adhesions that developed after an injury with a sharp object.
Material & Methods: A 58-year-old male was admitted to our hospital following the insertion of a nail into the ulnar side of the hypothenar region, initially without sensory disturbances or motor deficits in the ulnar nerve distribution. Intravenous antibiotics were administered and the patient was discharged two days later. After 40 days, he returned with an ulnar claw hand deformity, indicating injury to the motor branch of the ulnar nerve, although sensory function

was intact. Surgical exploration from Guyon's canal to the interosseous muscles under the flexor tendons in zone III was conducted. Partial dissection of the hypothenar muscles exposed the ulnar nerve, showing anatomical continuity without transection, slight swelling and fibrous tissue adhesions binding the nerve within the hypothenar muscles. The nerve was released from the adhesions.
Results: At 4 weeks post-operatively (post-op), there was notable improvement in finger mobility in the ulnar nerve distribution. By 3 months post-op, the fingers` mobility had nearly fully recovered. However, muscle atrophy restoration took 8 months in all muscles innervated by the ulnar motor branch.
Conclusions: Close follow-up of patients with hypothenar trauma, is essential to detect delayed ulnar nerve injury, even when there is no immediate evidence of nerve damage.

A-0463 VOLAR PLATE FIXATION VERSUS CAST IMMOBILIZATION IN ACCEPTABLY REDUCED INTRA-ARTICULAR DISTAL RADIUS FRACTURES: LONG TERM FOLLOW-UP OF A RANDOMIZED CONTROLLED TRIAL

B.M. Derksen[1], J.J. van der Poel[1], L.A. Rojer[1], C.A. Selles[2], M.A.M. Mureau[3], N.W.L. Schep[1]
[1]Department of Trauma and Hand Surgery, Maasstad Hospital, Rotterdam, the Netherlands; [2]Department of Surgery, Erasmus MC, University Medical Center Rotterdam, Rotterdam, the Netherlands; [3]Department of Plastic and Reconstructive Surgery, Erasmus MC, University Medical Center Rotterdam, Rotterdam, the Netherlands

Introduction: This study reports the long-term results of the Volar Internal Plate Fixation Versus Plaster Immobilization in Acceptably Reduced Intra-Articular Distal Radial Fractures (VIPAR) trial. The VIPAR trial showed that operatively treated patients had statistically better results at 12 months, the difference was not clinically relevant. However, surgery led to clinically relevant improvements in the first 6 months. Additionally, 28% of non-surgical patients required surgery within the first year due to loss of reduction and symptomatic malunion.
Aim: The aim of the present study was to evaluate the long-term follow-up for patients treated with volar plate fixation versus cast immobilization for a displaced and acceptably reduced intra-articular distal radial fracture.
Material & Methods: The primary outcome of the present study was the Patient-Rated Wrist Hand Evaluation score after a follow-up time of at least 5 years. Secondary outcomes were the Disabilities of the Arm, Shoulder and Hand questionnaire, complications, the need for additional surgery, implant removal and the need for additional treatment by (para)medics. All analyses were performed according to the intention-to-treat principle.
Results: A total of 62 patients (operative n=34, non-operative n=28) completed the long-term questionnaires. At 6.9 median years of follow-up, the median PRWHE score for the operative group was 0 (IQR=0-4), while this was 2.5 (IQR=0-3) for the non-operative group (p=0.28). In the non-operative group, 39% of the responders required subsequent surgery. The non-operative group that underwent subsequent surgery had a median PRWHE score of 3 (IQR=0-4) (subsequent surgery vs. operative p=0.20).
Conclusions: After 7 years of follow-up, there were no functional differences between patients treated with volar plate fixation versus plaster immobilization in acceptably reduced intra-articular distal radial fractures. However, both groups showed continuous improvement beyond the first year post-treatment.

A-0464 LIPOMA INVOLVING THE HAND AT AN UNUSUAL LOCATION

Samir Awwad
National guard hospital, Madina, KSA

Introduction: review the clinical presentation, radiological images, and outcome of Lipoma involving the hand at an unusual location. We believe that this manuscript will be of interest to the readership of your esteemed journal. To the best of our knowledge, only a few case reports have been published in this regard
Material & Methods: case reports
Conclusions: Every painless lump, regardless of its clinical inactivity, should be thoroughly examined to obtain an accurate diagnosis. The diagnosis is enhanced by combining clinical evaluation with advanced imaging modalities. The excision biopsy typically serves both diagnostic and therapeutic purposes.

A-0465 ULNAR NERVE ENTRAPMENT FOLLOWING DISTAL RADIUS FRACTURE – CASE MANAGEMENT

Christos Konstantinidis, Vasileios Panagiotopoulos, Sotiris Plakoutsis, Christos Kotsias, Charilaos Galanis, Alkisti Konstantinou, Nikolaos Vlachos, Konstantinos Konidaris, Evangelos Anagnostou, Dimitrios Tsiampas, Dimitrios Vardakas, Dimitrios Giotis
General Hospital of Ioannina, Ioannina, Greece

Introduction: The incidence of ulnar nerve paresis following distal radius fractures ranges from 0.05% to 0.2%.
Aim: The study aims to present a rare case ulnar nerve paresis occurring one week after open reduction and internal fixation (ORIF) of a distal radius fracture.
Material & Methods: A 40-year-old man presented to our hospital one week after a fall from standing height, with tenderness, severe pain and deformity in his left distal radius. Initial neurovascular function was normal. X-rays displayed an extra-articular distal radius fracture with displacement that could not be reduced by closed manipulation, so ORIF was performed. One week later, the patient returned with ulnar claw hand deformity due to distal ulnar nerve entrapment, prompting a second surgery. Intraoperative findings revealed the ulnar nerve adhered by fibrous tissue bands proximal to Guyon's canal; the nerve was released by severing the adhesions.
Results: Postoperatively, significant improvement in sensation in the ulnar nerve distribution was observed. Two weeks later, mobility in fingers innervated by the ulnar nerve improved. 6 weeks post-ORIF, fracture healing signs and near full finger mobility were noted, and by 3 months, the patient had fully resumed his daily activities.
Conclusions: Close follow-up after distal radius fracture osteosynthesis is essential to detect peripheral nerve injuries early. In this case, early investigation for potential nerve injury or entrapment by adhesions can prevent irreversible neurological deficits.

A-0466 THE USEFULNESS OF COMPOSITE GRAFTING IN THE FINGER TIP AMPUTATION IN CASE THAT REPLANTATION IS NOT POSSIBLE

Woosik Pae, Ji-Won Lee, Myung-Jae Yoo
Trauma Micro Recontructive Orthopedic & plastic center, Goodgeon Hospital, Korea

Introduction: The replantation of finger tip amputation is difficult and challenging generally. In case that replantation is not possible, composite grafting is a useful surgical method to improve skin viability and finger range of motion.

Aim: So, we investigated the clinical characteristics, functional outcomes and complications of composite grafting.
Material & Methods: Between April 2022 and March 2024, we reviewed the medical records of 27 patients who performed composite grafting, retrospectively. Finger tip amputation was classified by Ishikawa zone(I, II, III). After surgery, all patients were administered by topical antibiotics(QUINOVID, ofloxacin) and compressed & opened to maintain moist environment over 3 weeks. We evaluated postoperative finger shortening, distal interphalangeal joint range of motion and complications. Furthermore, we assumed a period of wound moisturization is one of the important factors to promote skin viability. Also successful composite grafting was defined as cases whether the distal phalanx tip not resulted to skin necrosis and performed reoperation even if there was a shortening of the distal phalanx.
Results: The Ishikawa's classification of finger tip amputation was zone I(n=7), zone II(n=14) and zone III(n=6). The ratio of man and female was 21 to 6 respectively. The mean age of patients was 55.1 yrs. The median follow up period was 4.2 months. The topical antibiotics applied to maintain wound moisturization for average 3.5 weeks. As for functional outcome, the mean of the distal interphalangeal joint flexion was 65.2 degrees. The estimated mean final distal phalanx shortening was 2.0 mm. The skin survival rate(success rate) of composite grafting was 24/27(88.9 %). The 3 patients experienced skin necrosis after surgery and needed revision operation.
Conclusions: Composite grafting is a useful treatment option for finger tip amputation in case that replantation is not possible.
Maintaining wound moisturization for over 3 weeks is the important factor to elevate skin survival rate and improve finger functional outcomes.

A-0467 THE EFFECTIVENESS OF FULL-THICKNESS SKIN GRAFT AND LOCAL FLAP IN THE FINGER TIP AMPUTATION WITHOUT AMPUTEE

Woosik Pae, Ji-Won Lee, Myung-Jae Yoo
Trauma Micro Recontructive Orthopedic & plastic center, Goodgeon Hospital, Korea

Introduction: In general, surgical management of finger tip amputation without amputee can be complex and difficult.
Aim: Of all the various surgical management options, the full-thickness skin graft and local flap were adopted in this study to restore soft tissue defect. We investigated the clinical characteristics and functional outcomes of finger tip amputation.
Material & Methods: Between March 2022 and April 2023, we reviewed the medical records of 53 patients retrospectively. 35 patients(group 1, 66%)) treated with full-thickness skin graft and 18 patients(group 2, 34%)) treated with local flap were investigated and compared to various clinical parameters. And also both groups were assessed for functional outcomes & complications. Finger tip amputation was classified as dorsal oblique, volar oblique or transverse type.
Results: The main cause of finger tip amputation was the use of bypass pruner. The mean age of group 1 and group 2 was 54.6±15.3 yrs and 52.3±12.4 yrs, respectively. The median follow up of group 1 and group 2 was 12.3±10.3weeks and 19.0±14.6 weeks. In both groups, main type of the amputation location was dorsal oblique type. As for functional outcome, the mean of the distal interphalangeal joint flexion and Quick-DASH score was 63.4±15.4degrees and 28.3±9.5% in group 1 and 55.6±18.5 degrees and 29.4±10.5% in group2, which were not statistically significant differences ($p>0.05$). The estimated mean amputee size was 1.37±0.2cm2 and 1.72±0.2 cm2 respectively, which was statistically significant difference ($p<0.05$). The complications of surgery included neurologic symptoms and joint contracture were 14(40%) and 3(8.6%) cases in group 1 and 3(16.7%) and 7(38.9%) cases in group 2.
Conclusions: Full-thickness skin graft and local flap procedures are useful treatment options for finger tip amputation without amputee, improving finger range of motion and decreasing joint contracture. But when the soft tissue defect is large, skin graft may be preferred to local flap.

A-0468 INDICATORS OF THE EFFECTIVENESS OF NON-SURGICAL TREATMENT OF THUMB CARPOMETACARPAL INSTABILITY: A PROSPECTIVE COHORT STUDY

Niek J. Nieuwdorp[1], Isabel C. Jongen[1], Caroline A. Hundepool[1], Robbert M. Wouters (1,3), Thybout M. Moojen[2], Ruud W. Selles[1,3], the Hand-Wrist Study Group, J. Michiel Zuidam[1]

[1]Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [2]Hand and Wrist Center, Xpert Clinics, The Netherlands; [3]Department of Rehabilitation Medicine, Erasmus MC, Rotterdam, The Netherlands

Introduction: Thumb carpometacarpal (CMC) joint instability, caused by ligament laxity, can lead to pain and reduced hand function. While non-surgical management is typically the first-line approach, it remains unclear which patients benefit most. Ligament reconstruction is considered if non-surgical treatment fails, but the choice for surgical treatment is controversial, and predictors of surgical conversion are poorly defined.

Aim: This study aimed to identify patient, clinical, and patient mindset factors associated with surgical conversion in CMC instability. Additionally, it examined how these factors relate to changes in pain and hand function during the initial three months of non-surgical treatment.

Material & Methods: This multicenter prospective cohort study included patients diagnosed with CMC instability who underwent three months of hand therapy and/or an orthosis. Pain and hand function were assessed using the Visual Analogue Scale (VAS, 0-100) at baseline, six weeks, and three months into treatment. Cox regression was used to identify the predictors of surgical conversion, while a linear mixed model evaluated factors influencing pain and function change during non-surgical treatment.

Results: Of the 451 included patients, 58 (13%) underwent surgery after a median follow-up of 6.0 years. There was major variability in conversion rates across surgeons. Patients seeking a second opinion were 2.8 times more likely to convert to surgery (p=0.003). Surgery was also more likely in patients treated on the non-dominant hand (1.7 times; p=0.038) and those who were unemployed (2.1 times; p=0.040). During the first three months of non-surgical treatment, patients with non-traumatic instability improved 4.2 VAS points less per month than those with traumatic causes (p=0.018). Unemployed patients improved 5.2 points less per month (p=0.014), and those with a concurrent diagnosis improved 3.8 points less per month (p=0.026).

Conclusions: Surgical conversion rates varied significantly between surgeons, highlighting the need for standardized guidelines. Key predictors of surgery included second-opinion status, unemployment, and involvement of the non-dominant hand. Pain severity and functional impairment did not predict surgery, supporting a conservative-first approach even in severe cases. Poorer outcomes from non-surgical care were linked to non-traumatic causes, unemployment, and concurrent diagnoses. These findings aid clinicians in identifying patients who may benefit from non-surgical care versus those more likely to undergo surgery.

A-0469 COST-EFFECTIVENESS AND COST-UTILITY OF A DYNAMIC LUCERNE CAST VERSUS IMMOBILIZATION WITH A STATIC INTRINSIC PLUS CAST IN ADULTS WITH METACARPAL FRACTURES

L.A. Rojer[1], D.A. Salentijn[2], P.A. Jawahier[1], R.N. van Veen[2], M. van Heijl[3], N.W.L. Schep[1], M.G.W. Dijkgraaf[4], on behalf of the Champagne study group

[1]Department of Hand and Wrist Surgery, Maasstad Hospital, Rotterdam, the Netherlands; [2]Department of Trauma Surgery, OLVG Hospital, Amsterdam, The Netherlands; [3]Department of Surgery, Diakonessenhuis, Utrecht, The Netherlands; [4]Department of Epidemiology and Data Science, Amsterdam UMC, Amsterdam Public Health, University of Amsterdam, The Netherlands

Introduction: Metacarpal (MC) fractures account for approximately 40% of all hand injuries. A functional dynamic Lucerne cast (LuCa) is a dynamic cast which allows functional treatment of MC fractures. The randomized study showed better functional results after six weeks and more patient comfort. However its economic efficiency compared to the standard static intrinsic plus cast remains unclear.

Aim: The aim of this study was to evaluate the economic efficiency of the dynamic Lucerne cast compared to the standard static intrinsic plus cast.

Material & Methods: We conducted cost-effectiveness (CEA) and cost-utility (CUA) analyses from the Dutch societal perspective for patients with solitary neck, shaft or intra-articular MC fractures two to five (excluding the fifth MC neck fracture).

Results: After twelve months there was no significant difference between LuCa and intrinsic plus casting in MHQ scores (mean difference -0.4 (BCa 96% CI: 1.7 to 0.9, p=0.56) and societal costs (mean difference -€167 (BCa 96% CI: €1930 to €1580), p=0.85). From a societal perspective, the probabilities of LuCa being cost-effective ranged from 56.7% to 53% on the short, respectively from 37% to 32.2% on the long term.

Conclusions: We determine that treating metacarpal fractures with LuCa is presumably as economically efficient as intrinsic plus casting. Since the RCT shows better functional results after six weeks in favor of the LuCa, we conclude that the LuCa is the preferred treatment.

A-0470 DISLOCATION OF THE FLEXOR OF THE V FINGER IN A FRACTURE OF THE THIRD DISTAL OF THE RADIO DURING A CROSSFIT TRAINING: A REVIEW OF THE LITERATURE AND A CASE REPORT IN AN ACTIVE YOUNG WOMAN

F. Vitali[1], G. Demontis[1], V. Mazzola[1], G. Pachera[1], A. Galuppi[1], E. Dapelo[1], M. Formica[2], S. Briano[1]

[1]Hand and Upper Limb Surgery Unit, San Martino Policlinic Hospital, Genoa, Italy; [2]Orthopaedic Clinic, University of Genoa, San Martino Policlinic Hospital, Genoa, Italy

Case Report: Fractures of the distal third of the radius can often lead to an injury of the DRUJ and secondary stabilizers. Dislocations of the flexors are rarely observed as a result of this type of injury. The authors present a review of the literature and the case of an active woman, 36-years-old, who came to an emergency department after a forearm trauma due to an incorrect performance during a CrossFit training. She presented a fracture of the third distal of the radius and apparent deficit in extension of the IV and V finger. She showed a bending attitude of the IV and V finger. Following an initial reduction and synthesis of the fracture, no lesions of the ulnar nerve were found. Subsequently orthopedic and radiological consultation, she was determined to have a dorsal dislocation of V finger flexor. This case report describes the clinical history, management and treatment of this rare case of flexor dislocation following fracture of the third distal radius.

A-0471 DO TRADITIONAL METHODS OF ASSESSING DISTAL RADIUS FRACTURES INCREASE THE LIKELIHOOD OF FAILURE OF OPERATIVE FIXATION?

Thomas Cash, Dileep Karthikappallil, Mattia Solari, Craig Wyatt, Graham Cheung, Daniel Brown
Liverpool University Hospitals NHS Foundation Trust

Introduction: Traditionally, classifications based on the interpretation of plain radiographs have been used for pre-operative evaluation of distal radius fractures (DRF). A seminal paper by Medoff in 2005 increased our understanding of DRF and proposed one such anatomical classification.

Certain intra-articular fragments including the volar-lunate facet (the so-called 'critical corner') are considered key to stabilising DRF. Failure to identify and therefore support key articular fragments has been shown to be the major mode of failure in operatively treated DRF (Newton 2023).

Aim: The aim of this study was to assess whether traditional methods, that is interpretation of plain radiographs and use of classifications based upon this, are sufficient to identify key fragments and thus be useful in pre-operative DRF fixation planning.

Methods: The study consisted of two parts. We identified a pool of complex adult DRF where both good quality plain radiographs and CT were available. Exclusions were those with previous surgery to the wrist and metalwork in situ.

Two senior hand and wrist surgeons (GC/DB) reviewed 73 patients from the pool. Fracture lines and key fragments were drawn on a compass grid and graded using the AO classification into simple, intermediate and complex. 20 experienced orthopaedic surgeons were asked to complete the same task on a random selection of 10 plain radiographs. The responses were grouped into; excellent, good, fair, poor and nil depending on the accuracy of interpreting the radiographs compared to the gold standard CT.

A further 45 patients from the pool had their CT scans evaluated. An attempt was then made to classify the fractures according to Frykman, Universal AO and Medoff.

Results: The identification of individual fracture fragments and fracture lines recorded on a compass grid showed poor correlation between radiographs and CT. This was true for simple, intermediate and complex fractures.

Of the 45 CT scans evaluated, all but 1 fracture was classifiable using Frykman and Universal with 38 (84%) and 40 (89%) fractures respectively given the most severe grade. All fractures were classifiable using AO with 41 (91%) fractures awarded grade C3.

We identified a mean 2.3 (SD 1.2) Medoff fragments per CT. However, a mean of 1.1 (SD 1.2) clinically relevant fracture fragments did not fit Medoff's description. The commonest reason was a comminuted radial column in 23 cases (51%).

Conclusion: Identifying fracture lines in DRF using plain radiographs alone is unreliable, even in experienced orthopaedic surgeons. Furthermore whilst traditional DRF classifications can be applied to CT, they seldom provide useful information. We suggest a low threshold to perform a CT scan in comminuted DRF to evaluate key fracture fragments. Once a CT has been performed descriptive terms should be used for the fragments as existing anatomical classifications cannot accurately describe the number and position of individual fragments.

This has a potentially significant clinical implication with inability to identify key fracture fragments during DRF fixation recognised as being the main cause of failure.

A-0472 THE MINDSET OF NON-TRAUMATIC HAND-WRIST INSTABILITY: IMPACT ON INITIAL PRESENTATION AND SURGICAL OUTCOME

Isabel C. Jongen[1,*], Niek J. Nieuwdorp[1,*], Caroline A. Hundepool[1], Mark J. W. van der Oest[1], J. Sebastiaan Souer[2], Ruud W. Selles[1,3], the Hand-Wrist Study Group, J. Michiel Zuidam[1]

[*]Contributed equally to this work; [1]Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [2]Hand and Wrist Center, Xpert Clinics, The Netherlands; [3]Department of Rehabilitation Medicine, Erasmus MC, Rotterdam, the Netherlands

Introduction: Generalized ligament laxity in the hand may manifest as midcarpal instability (MCI) or thumb carpometacarpal (CMC) instability, known to co-occur. Psychological distress has been previously linked to generalized ligament laxity, suggesting that patients with non-traumatic hand-wrist instability may be more susceptible to a negative mindset. Understanding patients' mindset is essential, as mindset is increasingly recognized as a key determinant of surgical outcomes.

Aim: This study aims to assess the mindset of patients with non-traumatic hand-wrist instability and to evaluate its impact on patient-reported pain and function, both before and after surgery.

Material & Methods: We included patients who underwent surgical stabilization for non-traumatic midcarpal or thumb CMC instability. Preoperative assessments involved the Pain Catastrophizing Scale (PCS), Patient Health Questionnaire (PHQ), Brief-Illness Perception Questionnaire (B-IPQ), and Credibility/Expectancy Questionnaire (CEQ). Pain and dysfunction levels were measured before and after surgery using the Visual Analogue Scale (VAS, range 0-100). Propensity score matching was used to compare the mindset of instability patients to control groups with other hand and wrist conditions, like osteoarthritis and Quervain's disease. Hierarchical linear regression to analyze the relationship between mindset and preoperative/postoperative VAS pain and function scores, adjusting for clinical characteristics.

Results: A total of 398 patients were included: 150 patients with CMC instability, treated with either Eaton-Littler (123) or figure-of-eight (27) ligament reconstruction, and 248 patients with MCI undergoing three-ligament tenodesis (31) or dorsal capsulodesis (218). Patients with non-traumatic hand-wrist instability exhibited a more negative mindset compared to control groups with other hand and wrist conditions. Mindset significantly influenced the initial presentation, accounting for an additional 25% of the variance in preoperative pain and 18% in preoperative function. Specifically, higher pain catastrophizing (Beta 0.54; 95% CI, 0.17; 0.92) and greater perceived impact of illness on daily life (Beta 2.98; 95% CI, 0.77; 5.19) were linked to increased preoperative pain. Additionally, less perceived control over the illness (Beta 1.53; 95% CI, 0.01; 3.06) and lower perceived effectiveness of treatment (Beta 2.52; 95% CI, 0.05; 4.99) were associated with worse preoperative hand function. However, mindset did not influence postoperative outcomes, indicating a limited impact on surgical outcomes.

Conclusions: When considering surgical management for patients with non-traumatic hand-wrist instability, the results of this study indicate that surgeons should be aware of the potentially more negative mindset of these patients compared to those with other common hand and wrist conditions. This is important as a negative mindset is linked with higher levels of pain and dysfunction preoperatively. However, mindset did not impact the surgical outcomes, suggesting that these patients should not be excluded from surgery based on their mindset alone.

A-0473 ACTIVE SHOULDER EXTERNAL ROTATION RECOVERY IN OPERATED UPPER BRACHIAL PLEXUS BIRTH INJURIES: IS XIN-SSN TRANSFER BETTER THAN C5-SSN GRAFTING?

Eva T.E. Ulmann[1], Martijn J.A. Malessy[1], Jochem Nagels[2], Willem Pondaag[1]
[1]Leiden NerveCenter, Dept of Neurosurgery, Leiden University Medical Center, Leiden, The Netherlands; [2]Leiden NerveCenter, Dept of Orthopedic Surgery, Leiden University Medical Center, Leiden, The Netherlands

Introduction: A key residual deficit in Brachial Plexus Birth Injury (BPBI) is the lack of active glenohumeral external rotation. Surgical options for reinnervating the suprascapular nerve (SSN) include grafting from a proximal stump and nerve transfer using the spinal accessory nerve (XIN) as a donor. The optimal surgical strategy is unclear from the current literature.
Aim: To assess result of active external rotation after nerve transfer or nerve grafting.
Material & Methods: We conducted a retrospective study (1990-2020) of children with a C5-C6 or C5-C6-partial C7 BPBI who underwent SSN grafting or transfer, with a minimum follow-up of 2 years. Outcome was assessed in degrees of active external rotation, and Mallet sub-scores for external rotation, hand-to-mouth and hand-to-head scores. The frequency of secondary shoulder procedures (muscle transposition and/or release) in both groups was also analyzed.
Results: The study included 245 patients: 179 (73%) underwent C5-SSN grafting and 66 (27%) XIN-SSN transfer. The transfer group demonstrated an active range of external rotation that was 30 degrees larger compared to the grafting group, after adjusting for sex, birthweight, and diagnosis. At age 3, 33% of children achieved a Mallet IV external rotation after nerve transfer compared with 17% after nerve grafting. A Mallet hand-to-mouth score of IV was obtained in 51% (transfer) versus 32% of children (grafting). Hand-to-head scores were a little better after nerve grafting, but not statistically significant. The 10-year cumulative risk of subsequent shoulder procedures was 30% for grafting and 24% for transfer (non-significant).
Conclusions: Spinal accessory to suprascapular nerve transfer yields superior active external rotation compared with nerve grafting. Future studies should investigate whether the long-term impact of trapezius muscle loss is acceptable, when nerve transfer is preferred in the presence of a graftable C5 root.

A-0474 DOES NPWT AFFECT VASCULAR SUPPLY TO THE FREE FLAP IN SEVERE EXTREMITY TRAUMA?

Hideyuki Ota[1,2], Satoshi Niwa[1,2], Hoyu Cho[1,2], Tomoyuki Tamemoto[1,2], Hideomi Takami[1]
[1]Department of Orthopaedic Surgery and Hand Surgery, Japan; [2]Hand and Microsurgery Center, Nagoya Ekisaikai Hospital, Japan

Introduction: It remains unclear how NPWT (Negative Pressure Wound Therapy) applied around a traumatic soft tissue defect, particularly when covered by a pedicle flap or a free flap with a skin graft, impacts flap vascularity.
Aim: This study investigates the effect using a simulated free flap model.
Material & Methods: A rectangular body was made from ultrasoft urethane resin, with a simulated flap containing an artificial blood vessel. This vessel was connected to an arterial sphygmomanometer filled with saline solution, stabilised at a -value of 15 mmHg. When a syringe filled with 10 ml of saline was placed on the simulated skin valve vessel, pressure fluctuations of +4 mmHg was observed, confirming that pressure fluctuated applied force. NPWT was placed on the simulated flap, with negative pressure varied across four conditions (1) 0 to 200 mmHg, (2) 0 to 100 mmHg, (3) 25 to 200 mmHg and (4) 100 to 200 mmHg. Arterial manometer values were recorded every second for each condition. Ten tests were performed to obtain mean and standard deviation values.
Results: Changes in NPWT pressure resulted in arterial fluctuations as follows:1.60 $\pm$ 2.49 mmHg (0-2.8 mmHg) in condition (1), 0.39 mmHg $\pm$ 0.16 mmHg (0-2.8 mmHg) in condition (2), 0.08 mmHg $\pm$ 0.11 mmHg (0-1.0 mmHg) in condition (3),

0.29 ± 0.39 mmHg (0-0.6 mmHg) in condition 4. These returned to a s 20 s after the start of each measurement.
Conclusions: Previous studies indicate that applying negative pressure with NPWT produces approximately 1/10th of the negative pressure value as positive pressure on the NPWT site. However, this study recorded only minor fluctuations (up to +2.8 mmHg on average) under the four conditions. In addition, the effect was small and transient, returning to a steady-state after 20 s. Therefore, no significant positive or physical pressure was observed on flap vessels.

A-0477 WITHIN PATIENT EXPERIENCES COMPARING HAND FUNCTION AFTER TRAPEZIECTOMY AND TOTAL JOINT ARTHROPLASTY IN THUMB BASE OSTEOARTHRITIS. A QUALITATIVE THEMATIC ANALYSIS

Elske Bonhof-Jansen[1], Betty de Jong[1], Paul Werker[2], Corry van der Sluis[3]
[1]Isala, Hand Wrist Center, Department of Hand Therapy, Zwolle, The Netherlands; [2]University of Groningen, University Medical Center Groningen, Department of Plastic Surgery, Groningen, The Netherlands; [3]University of Groningen, University Medical Center Groningen, Department of Rehabilitation Medicine, Groningen, The Netherlands

Introduction: In our recently completed double blind randomized study comparing the outcomes between total joint arthroplasty (TJA) and a trapeziectomy in patients with trapzeiometacarpal (TMC) osteoarthritis, no clinically relevant difference was found on the patient reported outcome measurement (PROM), the Michigan Hand Outcomes Questionnaire (MHOQ) at five years. PROMs only partially address the functional aspects that are important to patients and the importance, satisfaction and the meaning a patient assigns to the ability to perform different activities, can vary greatly between individuals
Aim: This study explored patients experiences and perspectives regarding the possible differences between trapeziectomy and TJA in everyday hand function after bilateral TMC surgery. Also we investigated whether the MHOQ represents these patient perspectives.
Material & Methods: A qualitative study was designed according to a thematical analysis using the six phase framework of Braun and Clarke. Patients who had bilateral surgery (both TJA and trapeziectomy) were included according to the purposeful sampling method. To achieve maximum variation in the sample, patients with varied socio-demographic characteristics were invited such as variation in gender, age, hand dominance and working versus retired population. Semi-structured interviews were conducted based on the MHOQ and the Disease Repercussion Profile (DRP) representing all levels of the International Classification of Functioning, Disability and Health.
Results: Sixteen patients were approached. We report preliminary results from 8 interviews (6 women, 2 men, mean age 64.8 (6.2) years, mean time since first TMC surgery 5 (1.5) years) out of 10 participants who provided informed consent. Three participants received a TJA and five a trapeziectomy on their dominant hand. During interviews, patients were encouraged to talk about their daily activities, focusing on their experiences and perceptions of thumb function, regarding all aspects of these activities and perceived differences between the thumbs. The primary reason for surgery in all cases was severe pain that impaired hand function and interfered with daily life. Irrespective of surgery type, participants reported that pain reduction had been achieved, though some continued to experience residual pain. All participants agreed that the recovery time after TJA was shorter than for trapeziectomy. Most did not consider postoperative thumb collapse following trapeziectomy to be an aesthetic or functional drawback. When asked to hypothetically choose a procedure again, three participants preferred TJA, four would choose trapeziectomy and one participant had no preference. Ability to perform precision skills and the degree of thumb control is often named as a benefit of TJA. This item is not captured by the MHOQ. Substantial variability was observed in MHOQ total scores (dominant hand, median 65.65 points, Q1 to Q3: 52.1 to 81.6).
Conclusions: These preliminary findings show varying patient experiences and preferences for TJA and trapeziectomy, with

no clear preferences for one treatment over the other. The degree of thumb control and the ability to perform precision tasks may be an important variable when choosing between surgeries. As this is not captured by the MHOQ, identifying an appropriate outcome measure would be of interest for future research.

A-0478 TOTAL JOINT ARTHROPLASTY VERSUS TRAPEZIECTOMY IN THE TREATMENT OF TRAPEZIOMETACARPAL JOINT ARTHRITIS: 5-YEAR FOLLOW-UP OF A RANDOMIZED CONTROLLED TRIAL

Elske E.D.J. Bonhof-Jansen[1], Tjeerd R. de Jong[2], Sander M. Brink[3], Ramon P. de Wildt[4], Paul M.N. Werker[5]
[1]Isala Hand-Wrist Centre, Department of Hand Therapy, Zwolle, The Netherlands; [2]Isala Hand-Wrist Centre, Department of Plastic Surgery, Zwolle, The Netherlands; [3]Isala Hand-Wrist Centre, Department of Rehabilitation Medicine, Zwolle, The Netherlands; [4]Leeuwarden Medical Center, Department of Plastic Surgery, Leeuwarden, The Netherlands; [5]University Medical Center Groningen and University of Groningen, Department of Plastic Surgery, Groningen, The Netherlands

Introduction: Several systematic reviews and meta-analyses investigated the best surgical procedure for the treatment of trapeziometacarpal osteoarthritis. Total joint arthroplasty (TJA) with a prosthesis repeatedly shows a faster recovery and better functional outcomes but with a higher complication rate compared to trapeziectomy. However, no clinically significant differences were found and all reviews concluded that the current evidence is of low quality. We have previously described the 1-year outcomes of a double anonymized RCT comparing trapeziectomy with TJA for the treatment of Eaton and Glickel (E&G) stage II to III TMC osteoarthritis (OA) (de Jong et al., 2023).
Aim: The current study describes the 5 years follow-up results of this study population, including long-term complications and survival.
Material & Methods: A total of 62 women aged 40 years and older, scheduled for surgery were randomized to trapeziectomy or TJA. The primary outcome was daily hand function measured with the Michigan Hand Outcome Questionnaire (MHOQ). Secondary outcomes were the MHOQ subscale scores, active range of motion, strength, satisfaction, willingness to undergo the same procedure again, complications and survival. To test the primary study hypothesis, a linear mixed model analysis was performed. Secondary outcomes were analyzed using unpaired t-tests, Mann-Whitney U test or Fisher exact test, depending on the types of data. When a significant and clinically relevant effect was observed, this was further explored using linear mixed model analysis to assess the longitudinal relationship and interaction with time. A Cox proportional hazard regression analysis was performed to calculate a hazard ratio for revision surgery.
Results: In each group 31 women with a mean age of 60 years were included and baseline characteristics were equally distributed. No statistically and clinically relevant difference in MHOQ total score was found after 5 years. Key pinch strength, patient satisfaction and willingness to undergo the same treatment again show a significant difference in favour of the TJA group. Patients in the prosthesis group have a lower, but not significant hazard for revision surgery. Five-year survival in the trapeziectomy group was 73% versus 93% in the prosthesis group.
Conclusions: Although the patient reported functional outcome of TJA in the treatment of TMC OA was not superior to trapeziectomy at 5-year follow-up, multiple secondary outcomes show a benefit for the TJA. This is in concordance with the results at 1 year.

A-0479 LONG-TERM RESULTS AFTER SURGICAL SEPARATION OF SIMPLE, COMPLEX AND COMPLICATED CONGENITAL SYNDACTYLY

Niko Kämppä[1,2], Noora Nietosvaara[3], Yrjänä Nietosvaara[2,4], Petra Grahn[2]

[1]Department of Hand Surgery, Helsinki University Hospital and University of Helsinki; [2]Department of Pediatric Orthopedics and Traumatology, New Children's Hospital, HUS Helsinki University Hospital, University of Helsinki; [3]Department of Orthopedics and Traumatology, Helsinki University Hospital, University of Eastern Finland; [4]Department of Pediatric Surgery, Kuopio University Hospital, Kuopio, Finland

Background: Syndactyly, a congenital hand anomaly characterized by fused digits, is categorized as simple (soft tissue fusion), complex (bony fusion), or complicated (fusion with abnormal bony, tendon, and ligament structures). While most studies focus on short- to medium-term outcomes of syndactyly surgery, this single-center study assesses long-term outcomes to evaluate progression of issues like web creep and scar contracture through growth and aging.

Material and methods: This study reports on 77 patients (113 affected hands) who underwent syndactyly separation surgery during early childhood at our institution from 1963 to 2015 and agreed to a follow-up visit. Among them, 49 patients had simple (60 released webs) or complex syndactyly (20 released webs). These were all grouped together as uncomplicated syndactyly. We assessed active range of motion (AROM), cold intolerance, sensory deficits, and scar quality (using the POSAS 2.0 scale, scored 6-60). Web creep was assessed from photographs taken at follow-up visits by two senior authors and graded according to the Withey score (graded 0-4, web equivalent to normal-web creep up to the PIP crease). Thirteen patients with complicated syndactyly (29 released webs) and 29 (53 separated webs) with syndromic complicated syndactyly (constriction band syndrome, Apert, longitudinal deficiencies, cleft) were partly analyzed separately from the uncomplicated due to their unique anatomical features, which precluded AROM and web assessment.

Finally, overall patient satisfaction was assessed by inquiring if patients would choose to undergo operative treatment again. P-values were calculated with the Chi square test for categorical and Mann-Whitney U test for continuous variables.

Results: With a median follow-up of 17.5 years (range 9-59 years), participants (75% male) were assessed at a median age of 22.4 years. In the uncomplicated group, 23% of fingers showed limited AROM. Patients with complex syndactyly had a higher, though not statistically significant, rate of AROM limitations than patients with simple (50% vs. 28%, $p=0.08$). 8 webs were deeper than normal webs and out of the remaining 72 webs 49 (68%) had web creep (mean grade 1.5), with no significant difference between syndactyly types (uncomplicated vs complicated, $p=0.48$).

Median observer rated POSAS scores indicated moderate scar quality (score of 15, 95% CI: 15-17), with no significant differences between simple, complex, or complicated cases. Sensory deficits (27% vs. 6.6%, $p<0.01$) and cold intolerance (43% vs. 14.5%, $p<0.01$) were more prevalent in complicated cases. Reoperation rates were higher for complex syndactyly (47%) compared to simple (22%, $p=0.03$) and similar between complex and complicated cases (42%).

Overall satisfaction seemed to be high as 91% of patients would have chosen to undergo operative treatment again.

Conclusions: Long-term outcomes for simple syndactyly separation are generally favorable, with infrequent reoperations. Complex and complicated syndactyly cases are associated with higher rates of sensory issues and reoperations.

A-0480 THE ROLE OF SELECTIVE SOFT TISSUE POLLICIZATION FOR THUMB & FIRST WEB RECONSTRUCTION

Babak Shojaie, Hossein Saremi, Amirreza Rostami, Can Cedidi
Department of Plastic, Hand and Reconstructive Surgery, Klinikum Bremen-Mitte, Göttingen University of Medical Science, Germany

Introduction: The repair of thumb firecracker injuries requires the highest level of precision due to the thumb's essential role as it contributes to 40% of the hand's function including grasp and pinch.
Aim: The purpose of this abstract was to introduce and evaluate the outcomes of selective soft tissue pollicization in a patient who sustained firecracker injuries.
Material and Methods: A 9-year-old patient suffered firecracker injuries resulting in third-degree burns and extensive damage to the right hand, including fractures, soft tissue loss, and neurovascular compromise. The thumb sustained multiple fractures, neurovascular avulsion, and a circular tissue defect. The index finger had distal phalanx ablation, a Gustilo type IIIB fracture of the proximal phalanx, and significant soft tissue damage, while the middle finger experienced distal phalanx ablation and a dislocated proximal phalanx fracture. The high thrombosis risk and damaged structures in the thumb and index limited the use of kite flap and standard pollicization, respectively. We used a modified first dorsal metacarpal artery flap to restore the thumb and first web space after selective second ray resection for necrotic tissue.
We delineated the dimensions of the required flap on the residual index finger. We dissected the flap from the proximal interphalangeal joint, with the elevation layer located in the epitendinous gliding layer. We then mobilized it over the flap pedicle. Next, we performed an incision through the periosteum at the level of the second metacarpal and detached the fascia overlying the first dorsal interosseous muscle. We ensured the preservation of the subcutaneous tissue, subcutaneous veins, and the third and fourth neurovascular bundles within the pedicle, repositioning them within the soft tissue. We meticulously thinned the cutaneous flap to maximize vascularized tissue preservation on the pedicle. We elevated the flap pedicle in the subfascial plane, allowing for the identification and conservation of the feeding vessels, the third nerve, and residual branches of the superficial radial nerve. We established a flap pedicle width of approximately 3 cm without further dissecting the vessels. Distally, we extended the dissection to the middle phalanx to ensure complete separation of the affected tissue. This was followed by an osteotomy at the base of the second metacarpal, facilitating the subsequent contouring of the soft tissue envelope. Once we adequately mobilized the flap pedicle, we transposed it in a wrap-around pattern to the remaining thumb, covering the defect on the thumb and first web space, and ensuring a tension-free adaptation at the recipient site.
Results: Post-operation evaluation revealed satisfactory aesthetic outcomes and a remarkable recovery of hand function. The patient demonstrated notable improvements in performing complex motor tasks, such as grasping and pinching, as well as a marked enhancement in sensory perception.
Conclusions: With this technique, we can perform a single-step reconstruction of a mutilated thumb using vascularized soft tissue, even in the absence of the bone part of the index finger. Despite the superior aesthetic and functional success of this procedure compared to other methods, we can use follow-up procedures to achieve better function and aesthetic outcomes.

A-0481 DISTAL BICEPS TENDON RUPTURE: OUR EXPERIENCE COMPARATIVE VS OPERATIVE TREATMENT USING SUTURE ANCHORS THROUGH A SINGLE ANTERIOR APPROACH

F.Vitali[1], G. Demontis[1], V.Mazzola[1], G. Pachera[1], A. Galuppi[1], E. Dapelo[1], M. Formica[1,2], S.Briano[1]
[1]Hand and Upper Limb Surgery Unit, San Martino Policlinic Hospital, Genoa, Italy; [2]Orthopaedic Clinic, University of Genoa, San Martino Policlinic Hospital, Genoa, Italy

Background: Distal biceps tendon rupture is an uncommon injury involving the dominant arm in middle-age male population. With this retrospective cohort study, we reported the clinical outcomes of patients treated with conservative vs operative treatment with tendon reinsertion using anchors through a single anterior approach.
Methods: 140 patiens with distal biceps tendon rupture were treated between 2010 and 2024 and they were evaluated at follow-up considering the recovery of rom in flexion-extension and prono-supination and examinated with DASH, MAYO and OXFORD score.
Results: The ROM recovery shows fine results, with a good average of flexion-extension and prono-supination. The average DASH score was 3; the MAYO elbow score was 88 and the OXFORD elbow score 40. There were reported ten cases of complications.
Conclusion: We prefer in the most of the cases a operative treatment due to better clinical outcomes thanks to an anatomical reinsertion of distal biceps tendon in its anatomical site, moreover a single anterior approach can minimize the risk of nerve injury and heterotopic ossifications.

A-0482 FUNCTIONAL CLASSIFICATION OF CARPAL LIGAMENTS, KINETIC STUDY BY 3D HANDY SCAN

Inma Puig de la Bellacasa[1], Montse del Valle[2], Laura Rey[3], Diana Noriego[4], Angel Ferreres[5], Alfonso Rodriguez Baeza[6]
[1]Hospital Universitari Mutua Terrassa, Terrassa, Spain; [2]Hospital Esprit Sant, Badalona, Spain; [3]Hospital Althaia, Manresa, Spain; [4]Hospital Josep Trueta, Girona, Spain; [5]Institut Kaplan, Barcelona, Spain; [6]Dpto Anatomy and morphologic sciences. Bellaterra, Spain

Introduction: The classification of carpal ligaments has been modified due to a better understanding of carpal kinetics and their response to isometric loading. Their distribution and specific design are prepared to better withstand loads in axial compression and traction.
Aim: Evaluate the role of ligaments based on their behavior patterns under isometric loading conditions, and prove the hypothesis regarding the new functional classification of carpal ligaments.
Material & Methods: A cadaver study was conducted, selecting 12 carpal ligaments, measuring their surface length, and assessing the positive or negative variation of its length from the position of carpal supination to pronation using a portable 3D scanner. There are no precedents in the literature using this technology on carpal ligaments, but it has been utilized for other soft tissue studies. The 3D Handy Scan scanner is a portable device that uses structured light laser to capture the three-dimensional geometry of ligaments under different conditions, evaluating any change in shape or tension. Subsequently, we evaluated how each group of ligaments behaves when one fails.
Results: Carpal ligaments can be divided into two functional groups. One group resists rotation force in pronation, we call them "antipronator ligaments," and the other group resists supination forces, we call them "antisupinator ligaments." The ones that work as antipronators are: dorsal scapholunate ligament, dorsal intercarpal ligament, radioscaphocapitate ligament, volar lunotriquetral ligament, and ulnotriquetral ligament. The carpal ligaments that work as antisupinators are: dorsal radiotriquetral ligament, palmar medial arquate ligament, scaphotrapezial ligament, volar scapholunate ligament, and ulnolunate ligament. Ten out of the 12 ligaments studied show a clear antipronator or antisupinator

function with statistically significant differences. Only two show an antipronator tendency, but no statistically significant differences were found. When the scapholunate ligament fails, all antipronators maintain their function, with the dorsal intercarpal ligament tripling its length. When the palmar medial arquate ligament fails, all antisupinators maintain their function, with the dorsal radiotriquetral and scaphotrapezial ligaments notably increasing its length. These data are also statistically significant.
Conclusions: We have demonstrated that there are two groups of ligaments arranged in helical disposition in opposite directions, controlling their combined action. When evaluating ligaments in the absence of the dorsal scapholunate ligament, the dorsal intercarpal ligament undergoes the most variation in length, indicating its importance as a ligamentous structure that can compensate for a deficiency or dysfunction of the dorsal scapholunate ligament. When the palmar medial arquate ligament is absent, the dorsal radiotriquetral and scaphotrapezial ligaments show increased length variations, acting as isodynamic antisupinators.

A-0483 ANATOMICAL IMPLANT IN PYROCARBON FOR KIENBÖCK'S DISEASE: A CASE REPORT

V. Mazzola[1], F. Vitali[2], M. May[1], G. Demontis[3], G. Pachera[3], A. Galuppi[3], E. Dapelo[3], M. Formica[1], S. Briano[3]
[1]Orthopedic Clinic, IRCCS San Martino Polyclinic Hospital, Genoa, Italy; [2]Emergency Orthopedics and Traumatology Unit, IRCCS San Martino Polyclinic Hospital, Genoa, Italy; [3]Hand and Upper Limb Surgery Unit, IRCCS San Martino Polyclinic Hospital, Genoa, Italy

Context: Kienböck's disease typically presents in male patients aged between twenty and forty years, and its etiology remains controversial to this day. Various treatments have been described, including different types of implants to replace the lunate. We report the case of a twenty four year-old patient involved in manual labor affected by Kienböck's disease at stage III B-C according to Lichtman, who underwent lunate replacement surgery with an anatomical pyrocarbon prosthesis and was re-evaluated six years post-surgery.
Materials and Methods: The patient underwent lunate replacement surgery with an anatomical pyrocarbon prosthesis. Prior to the surgery, he experienced pain in the wrist and hand even at rest, along with a limitation in range of motion (ROM) and strength. Diagnostic examinations (X-rays and MRI) revealed bone necrosis of the lunate. He was followed up with clinical assessments using VAS, QDASH, and PRWE scores along with annual radiographs.
Results: Six years after the surgery, the subjective pain assessment using various tests (VAS, QDASH, and PRWE) showed satisfactory results. The ROM of the wrist remained unchanged post-surgery, and the two-digit grip strength was approximately 75% of the contralateral hand. The radiographs did not show any mobilization of the prosthetic component.
Conclusion: We believe that in Kienböck's disease at stages III B-C, prosthetic replacement with anatomical devices is a choice that can restore and maintain midcarpal and radiocarpal biomechanics, potentially yielding excellent long-term functional results.

A-0484 A SIMPLE SURGICAL TECHNIQUE FOR ARTHROSCOPIC REPAIR OF TRAUMATIC RADIAL –SIDE PERIPHERAL TFCC TEAR

Babak Shojaie, Nagham Bazzi, Hossein Saremi
Department of Plastic, hand and Reconstructive Surgery, Klinikum Bremen-Mitte, Göttingen University of Medical Science, Germany

Our new simple technique for traumatic radial -sided TFCC repair overcomes the need for a Targeting device. It is necessary to bring to attention, in developing countries, where the health and medical costs burden both the government and the

community, such alternatives are imperative and can greatly cut down costs. Further retrospective cohort studies including a larger number of patients and assessing TFCC repair through this technique are now warranted.
We introduced a simple surgical technique for arthroscopic repair of traumaticradial –side peripheral TFCC tear. In spite of the various surgical techniques found in the literature, the simplicity of the current technique, adequate satisfaction and eliminating the use of a targeting device , is what sets this apart. For emphasis, this technique is less time consuming and is cost-effective with satisfactory result. The surgical course was smooth without any reported complications. No superficial or main nerve injury were reported.

A-0485 A MULTICENTER, EVALUATOR-BLINDED, RANDOMIZED EVALUATION OF CARBOXYMETHYLCELLULOSE AND POLYETHYLENE OXIDE ANTIADHERENTIAL GEL FOLLOWING REVISION SURGERY FOR PERSISTENT OR RECURRENT CARPAL TUNNEL SYNDROME

Stefano L'Erario, Cesare Tiengo, Franco Bassetto
Clinic of Plastic, Reconstructive and Aesthetic Surgery, Padua University Hospital

Introduction: Following surgical repair of carpal tunnel syndrome (CTS), fibrosis around the median nerve commonly develops, potentially leading to adhesions that cause pain and reduce nerve function in the hand. Revision surgery using a hypothenar fat pad flap to cover the median nerve is a standard method to reduce fibrosis and recurrence, though it may lengthen surgery and increase the risk of postoperative complications. Carboxymethylcellulose and polyethylene oxide antiadherential gels (CMP-PEO), a synthetic coating for nerve protection, have demonstrated positive outcomes in clinical studies. However, controlled trials comparing CMP-PEO to the traditional hypothenar fat pad flap for median nerve coverage following CTS revision surgery are lacking.
Aim: This study aims to evaluate the clinical benefits of using CMP-PEO for median nerve protection versus the standard hypothenar fat pad flap after revision surgery for recurrent or persistent CTS. We hypothesize that CMP-PEO will reduce postoperative complications and save operative time compared to the hypothenar fat pad flap.
Material & Methods: This is a prospective, multicenter, randomized, evaluator-blinded clinical trial. Participants with persistent or recurrent CTS will be randomized 1:1 to either CMP-PEO application (Group 1) or hypothenar fat pad flap coverage (Group 2) following revision surgery and neurolysis. A total of 50 participants (n=25 per group) will be enrolled across multiple centers. Outcomes will be assessed at baseline, and at 1, 4, and 12 weeks post-surgery. Key measures include pain using the Visual Analog Scale (VAS), hand function via the Quick Disabilities of the Arm, Shoulder, and Hand (Quick DASH) score, neuropathic pain via DN4 score, nerve recovery assessed by electroneuromyography, and grip strength using a dynamometer. Data collection will be performed by evaluators blinded to treatment assignment.
Results: By comparing CMP-PEO to the hypothenar fat pad flap, this study aims to determine the effectiveness of CMP-PEO as a synthetic barrier in minimizing postoperative fibrosis and improving clinical outcomes. Previous studies suggest benefits of CMP-PEO in reducing adhesions and supporting nerve healing, but comprehensive data on pain reduction and functional recovery are still needed. This trial will provide insights into the comparative efficacy of CMP-PEO in real-world clinical settings, which may impact standard care by reducing complications associated with the hypothenar fat pad flap.
Conclusions: This multicenter randomized trial will evaluate the potential of CMP-PEO as an alternative to the hypothenar fat pad flap for managing persistent or recurrent CTS. By addressing primary endpoints of pain and paresthesia and secondary endpoints such as functional recovery and neuromuscular performance, this study aims to contribute valuable data to the field of hand surgery and potentially refine treatment standards for CTS revision repair.

A-0486 PERI-IMPLANT FRACTURES OF THE RADIUS: PROPOSED SURGICAL TECHNIQUE

G. Pachera[3], F. Vitali[2], V. Mazzola[1], M. May[1], G. Demontis[3], A. Galuppi[3], E. Dapelo[3], M. Formica[1], S. Briano[3]
[1]Orthopedic Clinic, IRCCS San Martino Polyclinic Hospital, Genoa, Italy; [2]Emergency Orthopedics and Traumatology Unit, IRCCS San Martino Polyclinic Hospital, Genoa, Italy; [3]Hand and Upper Limb Surgery Unit, IRCCS San Martino Polyclinic Hospital, Genoa, Italy

Peri-implant fractures are a rare complication in the anatomical area of the wrist, unlike those that may occur in other sites such as the hip, femur, and knee. However, in recent years there has been an increase in cases of peri-implant fractures in the distal radius. This study aims to present our experience regarding the surgical technique applied to address this type of complication.

Materials and Methods: A total of 6 patients were included in this study, consisting of 3 females and 3 males, aged between 43 and 71 years, all treated over the last 6 years at the San Martino Polyclinic Hospital. The inclusion criterion was peri-implant fractures of the distal radius with a minimum follow-up of 1 year. All patients had a different type of implant. These patients were clinically and radiographically followed for a period of 1 year and underwent the DASH evaluation test. We applied the same surgical planning to all the mentioned patients.

Results: In all patients, the same surgical technique was applied: after an incision at the previous surgical scar, once access to the bone was achieved, the cortices of the fracture focus were cleaned, followed by temporary fixation with K-wires. Then, the removal of the plate was performed, along with definitive fixation using a longer plate. At 4 weeks, the patient begins a targeted physiotherapy program aimed at functional recovery. Radiographic controls are performed at 1, 3, 6 months, and 1 year post-surgery. All patients healed without signs of mobilization of the fixation devices. Clinically, in all cases, we observed optimal functional recovery of wrist flexion-extension and pronation-supination movements, as well as good grip strength. None of the patients experienced postoperative complications, either mechanical or infectious.

Discussion: As seen from our case series, it is evident that distal radius peri-implant fractures do not depend on the type of implant used for the reduction and fixation of the initial wrist fracture, but rather are mostly influenced by the trauma dynamics and the point of least resistance, which usually coincides with the last locking screw of the plate, with distal fractures of the plate being more frequent.

The literature does not recommend the removal of the plate as a preventive measure for peri-implant fractures, but rather in cases of intolerance to the fixation device, which is usually patient-dependent.

Conclusion: The percentage of removals of fixation devices in the distal forearm is trending downward in the literature, while the number of cases of distal radius fractures treated surgically with fixation devices is increasing. These two factors, coupled with the increasing average life expectancy and age-related accidental falls, may lead to a rise in peri-implant fractures even in the distal radius. It may, therefore, be useful to consider whether the risk of a peri-implant fracture should be a potential indication for plate removal.

A-0487 THUMB ANTERO-POSTERIOR INSTABILITY IN METACARPOPHALANGEAL JOINT IN TEENAGERS

Cindy Bouvet, Nicolas Balagué
Wallis Hospital, Sierre, Switzerland

Introduction : instability of the metacarpophalangeal joint of the thumb (MCP) causes very significant functional disconfort. Faced with ligamentous laxity in teenager, this problem can become chronic with an antero-posterior instability. We describe 2 clinical cases.

Case n°1 : Young 15 years-old patient with hyperlaxity suffered from a direct trauma on tje thumb. He is learning a manual

worker. At the time of the trauma, we noticed a hyperextension of the MCP of the thumb. A MRI showed a dorsal capsule lesion of the MCP without ligamentous or tendon lesion. Patient benefit from conservative treatment with occupational therapy (EPB and FPB reinforcement) and protective splint. Intially evolution was good. One year after intial trauma, pain came back without new trauma. Clinicaly we found an antero-posterior instability of the MCP with hyperextension, greatly bothering the patient. New imaging shoed integrity of the MCP joint structures.
Faced with a patient with hyperlaxity aiming for manual activity surgical treatment is proposed. We retained the palmar plate using trans-osseous points. The patient benefits from 6 weeks of immobilization. At 3 months post-operative the patient is very satisfied with the result and return to his manual work learning.
Case n°2 : Young girl, 11 years-old with hyperlaxity, who presented with pain following a floor exercice. Clinically we found antero-posterior instability of the MCP of the thumb with hyperextension. MRI showed a partial distal tear of the ulnar collateral ligament. She had one month of MCP immobilization. After 11 months post-trauma, instability is till present and functionnally disturbing the patient. Face to failure of the treatment with EPB reinforcement and splint, surgical treatment was decided. Patient benefited from trans-osseous palmar plate suture. At 3 months post-op patient is very satisfied with no pain and good mobility.
Discussion : In the literature, we find anatomical description of the MCP dorsal part. volar plate stability is mainly described in advanded trapeziometacarpal osteoarthritis with associated MCP instability. There is very little lietrature on pediatric cases and even less on hyperlaxic teenager. This instability can be very disturbing is daily life activities. First it is necessary to try a conservative treatment. It antero-posterior instability persists, palmar plate rentetion should be considered. This surgery allows stability of the joint and give good patient satisfaction.
Conclusion : MCP antero-posterior instability in teenager can be treated with surgery on the palmar plate with good clinical results.

A-0488 ARTHROLYSIS OF PIP JOINT IN DUPUYTREN'S CONTRACTURE

Ilse Degreef, Floor Van Den Eynde
Leuven University Hospitals, Orthopaedic Department, Gasthuisberg, Leuven, Belgium

Introduction: In severe cases of Dupuytren's disease, complete extension cannot always be achieved with fasciectomy. The value of arthrolysis in these cases remains controversial.
Aim: In this literature review, the clinically added value of arthrolysis in flexion contractures of the proximal interphalangeal joint is investigated. The extension gain and possible post-operative flexion deficit was reviewed.
Material & Methods: Multiple databases were searched for articles comparing the improvement of flexion contractures at the level of the proximal interphalangeal joint after fasciectomy alone (control group) or fasciectomy followed by arthrolysis (intervention group).
Results: Seven studies with a total of 371 joints were included. No significant difference in the correction of flexion contractures post-operatively between the control or intervention group was found. In only one of the included studies post-operative flexion deficit was evaluated as a clinical outcome parameter, but no difference between the two groups could be demonstrated.
Conclusions: Although the control and intervention group appear to have similar results, all included studies have significant selection bias. Results must therefore be handled with caution. There seems to be a subgroup of patients who have important impairment of the capsulo-ligamentous structures surrounding the joint. This group might benefit from arthrolysis, but the results on long-term cannot be stated with certainty. Further prospective and randomised research must clarify this.

A-0489 DISTAL ULNA FRACTURE IN ASSOCIATION WITH DISTAL RADIUS FRACTURE: OUR PROPOSED CLASSIFICATION

F.Vitali[1], G. Demontis[1], V.Mazzola[1], G. Pachera[1], A. Galuppi[1], E. Dapelo[1], M. Formica-[2], S.Briano[1]
[1]Hand and Upper Limb Surgery Unit, San Martino Policlinic Hospital, Genoa, Italy; [2]Orthopaedic Clinic, San Martino Policlinic Hospital, Genoa, Italy

Introduction: The distal ulna is composed of the ulnar styloid, ulnar head, and distal ulnar metaphysis. Fractures of the distal ulna are rarely isolated and often concomitant with fractures of the distal radius, with an incidence reported in the literature ranging from about 3 to 6 %(1). Treatment of fractures of the distal ulna should be considered at the end of treatment of the distal radius (3). These fracture are increasing due to aging of the population and thus increasingly active elderly with increased risk of more complex fractures.
They are unstable fractures, because they involve distal radius-ulnar, TFCC and secondary stabilizers.In recent years much more emphasis has been placed on the ulnar side.
Classifications we have available are morphological classifications that do not guide us in treatmentAim: The purpose of this retrospective study is to try to classificate this kind of fractures in order to guide to a correct treatment.
Material & Methods: At Policlinico San Martino Hospital in Genoa, a total of 40 patients from 2018 to 2024 who were included in our study underwent surgery for distal ulna fracture associated with distal radius fracture in our Unit. Inclusion criteria were as follows: distal ulna fracture associated with distal radius fracture, closed fracture, surgical treatment within 15 days after injury.
Biographical data (sex, age, smoking and any comorbidities) were evaluated; classification of distal ulna fractures according to Biyani(2)and AO classification was performed.
We divided our classification into five different groups based on the type of displacement, the degree of comminution, the energy of the trauma, and the anatomical forces involved in the displacement.
Currently, classifications in the literature are purely morphological and do not provide guidance for treatment.
We believe that our classification can help categorize fractures and select the most appropriate treatment for each specific type of fracture.

A-0490 SURGICAL TREATMENT OF OSTEOCHONDRAL DISSECANS IN CHILDHOOD - A REPORT OF TWO CASES

Gergő Józsa[1], Lamberti Anna Gabriella[1], Tamás Kassai[2]
[1]Division of Pediatric Surgery, Traumatology and Otorhinolaryngology, Department of Pediatrics, Clinical Complex, University of Pécs, Pécs, Hungary; [2]Department of Pediatric Traumatology, Dr. Manninger Jenő National Traumatology Center, Budapest, Hungary

Introduction: Osteochondral dissecans (OCD) is a joint condition in which a variable amount of bone and its adjacent cartilage lose their blood supply, resulting in localized bone necrosis. This pathology predominantly affects the knee, ankle, and elbow joints, and it is of particular concern in the pediatric population due to the implications for joint development and long-term function. While the exact etiology remains unclear, factors such as repetitive microtrauma, genetic predisposition, and vascular insufficiency have been implicated. The incidence of OCD in children is increasing, likely due to heightened awareness and improved diagnostic techniques.
Aim: The authors present 2 cases treated by mosaicplasty and their results.
Cases: A 15-year-old girl was examined for left elbow pain that had been present for 6 months. The patient is an active athlete, practicing rhythmic gymnastics. She does not recall any major injuries, only several minor ones. An MRI scan

revealed osteochondritis dissecans (OCD) in the capitulum humeri area with a free cartilage fragment. During surgery, the left elbow joint was approached from the radial side, and the separate cartilage fragment was removed. Given the presence of a 1 cm diameter cartilage defect, a mosaicplasty was performed using a corticospongious block taken from the lateral condyle of the femur. No complications occurred after the surgery, and physiotherapy was initiated. Four months later, a follow-up MRI showed that the mosaicplasty had healed and the bone block had integrated. Six months post-surgery, the elbow joint function was fully restored, and the child returned to weight-bearing activities. A one-year follow-up showed good functional results; the child actively participated in sports and remained symptom-free.
The authors examined a 16-year-old boy at the outpatient clinic for recurrent left elbow joint pain, which initially occurred with exertion and had been present for several years. An X-ray suggested the possibility of osteochondritis dissecans (OCD) in the capitulum humeri, which was confirmed by CT and MRI scans. During surgery, the dorsal approach to the left humero-radial joint was taken, and the damaged 1 cm diameter cartilage-bone defect was removed. A spongiosa graft covered with cartilage was taken from the anterior surface of the lateral condyle of the femur and implanted. The postoperative period was uneventful, with no complications observed. Post-surgery, physiotherapy, and rehabilitation were initiated. The follow-up is in progress.
Conclusions: Osteochondritis dissecans (OCD) in the pediatric population presents a significant challenge due to its potential to impair joint function and hinder physical activity. Early diagnosis and appropriate management are crucial for preventing long-term complications and ensuring optimal outcomes for affected children. The cases discussed highlight the importance of utilizing advanced imaging techniques for accurate diagnosis and the effectiveness of surgical intervention. Postoperative rehabilitation plays a vital role in ensuring complete recovery and the return to full activity. Continued follow-up is essential to monitor healing and functional outcomes.

A-0491 THE INFLUENCE OF DURATION OF IMMOBILIZATION ON THE OUTCOMES OF CONSERVATIVELY TREATED MINIMALLY DISPLACED DISTAL RADIUS FRACTURES - A SYSTEMATIC REVIEW AND META-ANALYSIS

Shubashri Jeyaratnam[1], Zhixue Lim[1], Lim Jin Xi[1], Sandeep Sebastin[1], Soumen Das De[1] , Vieda Lusa[2], Teemu Karjalainen[3]
[1]Department of Hand and Reconstructive Microsurgery, National University Hospital Singapore, Singapore; [2]Central Finland Healthcare District, 40620 Jyavaskyla, Finland; [3]Department of Hand and Microsurgery, Tampere University Hospital, 33521 Tampere, Finland

Introduction: The vast majority of minimally displaced distal radius fractures are treated non-surgically. The optimal duration of immobilization for these fractures has not been defined. A shorter duration of immobilisation will allow earlier return to function and minimise costs to the patient, healthcare system and society.
Aim: The aim of this study is to conduct a systematic review and meta-analysis of the literature on conservatively treated minimally displaced distal radius fractures to determine the effect of the duration of immobilisation on the outcomes.
Material & Methods: The initial search criteria yielded 2262 results which were streamlined to 8 studies meeting the criteria for inclusion and reported according to PRISMA guidelines. These studies were stratified into two groups determined by the duration of immobilisation. The first group comprising 4 studies was immobilised for a shorter duration (1-2 weeks) while the second group comprising the other 4 studies was immobilised for a longer duration (3-5 weeks). Two reviewers independently agreed on eligibility and any discordance was rectified by a third independent reviewer. A risk of bias analysis was also performed by two independent senior authors. Patient reported outcome measures were reviewed at different time points – up to 6 weeks, 6 weeks to 3 months, from 3 months to 6 months and from 6 months to 2 years. A GRADE system of evidence was used to stratify the quality of evidence for each domain reviewed.

Results: A shorter duration of immobilisation of 1-2 weeks for non or minimally displaced distal radius fractures yields comparable or better functional and radiological outcomes compared to longer periods of immobilisation, irrespective of the modality of immobilisation. The certainty of evidence for this is low to moderate. Range of motion and grip strength information was not available for analysis.
Conclusions: A shorter duration of 1-2 weeks immobilisation for a minimally displaced distal radius fracture may potentially be considered as the standard of care for these patients. There is room for a further trial to increase the certainty of evidence prior to this becoming a recommended standard of care.

A-0492 STEGED TENDON GRAFT AT PEDIATRIC AGE GROUP

Samir Awwad
National guard hospital, Madina, KSA

Introduction: staged tendon graft surgery in pediatric age group still challenging issues and matters of debate
Aim: staged tendon graft had a place at early childhood
Material & Methods: evaluation of cases done by the surgeon for five cases at children
Results: ptp zero
Conclusions: staged tendon graft in children could be an option at selected cases

A-0493 THE HUNGARIAN SUPRACONDYLAR HUMERUS FRACTURE REGISTER – FIVE YEARS OF EXPERIENCE

Anna Gabriella Lamberti[1,2], Aba Lőrincz[2], Gergő Józsa[1,2]
[1]Division of Pediatric Surgery, Traumatology and Otorhinolaryngology, Department of Pediatrics, Clinical Complex, University of Pécs, Pécs, Hungary; [2]Department of Thermophysiology, Institute for Translational Medicine, Medical School, University of Pécs, Pécs, Hungary

Introduction: Supracondylar humerus (SCH) fractures are among the most common and challenging pediatric fractures requiring surgical intervention. Fractures with significant displacement, rotation, and/or vascular or nerve injuries necessitate surgical treatment. The operative care mainly involves minimally invasive, percutaneous pin fixation. In cases of SCH fractures without a pulse, open reduction is often required. The number of pins and their entry points may vary depending on the treating institution and the surgeon's preference.
Aim: The authors aimed to provide a descriptive evaluation of the characteristics of SCH fractures requiring surgical treatment.
Material & Methods: The authors analyzed prospectively collected data of children with SCH fractures who underwent surgery between September 2018 and June 2023, using the Hungarian SCH Fracture Registry, involving seven institutions. The results were examined based on the following criteria: demographic characteristics, BMI, mechanism and type of injury, initial physical examination findings, type of antibiotics administered pre- and postoperatively, use of pain relief, level of surgical competence, type of reduction, surgical characteristics, early complications, and the timing and method of metal removal.
Results: At the time of the study, the SCH Fracture Registry included a total of 356 cases. The gender distribution of the injured children was balanced (f-m: 53-47%), with an average age distribution of 6.5 years (range 0-15 years). More than half of the children had a BMI above normal (>25). During the initial physical examination, radial pulse assessment

by palpation (99%) and Moberg schema assessment (96%) were performed in almost all cases, and in the majority the oxygen saturation measurement also (72%).
Nearly 90% of the children suffered extension-type injuries, and in 60% of the cases, rotational displacement was observed on X-ray images, with fracture fragments not in contact in 25% of the cases. Half of the children received pain relief before surgery, and approximately 90% received prophylactic antibiotics, predominantly cefazolin. About two-thirds of the surgeries were performed by senior or junior specialists, with closed reduction occurring in approximately 80% of cases. On average, 2 Kirschner wires (1.8 or 2.0 mm in diameter) were used for fracture fixation. The average duration of surgery was 49 minutes (range 10-405 minutes).
For postoperative pain management, local anesthesia was used in about half of the cases. Postoperative antibiotic administration was necessary in 15 cases, and thrombosis prophylaxis in 2 cases. Complications occurred in 10% of cases, with two-thirds being neurogenic complications. Reoperation was required in 10% of cases, predominantly for neurolysis. Hardware removal was performed under
local anesthesia in 61% of cases, on average in the fifth week post-surgery.
Conclusions: The SCH Fracture Registry provides an opportunity to observe and compare characteristics and complications based on the severity of the fractures and the type of fixation method across a large number of cases. Using the results, the authors plan to develop a prognostic scoring system, which they hope will improve the quality of care.

A-0494 PERCUTANEOUS NEEDLE FASCIOTOMY (PNF) VERSUS OPEN FASCIECTOMY IN DUPUYTREN'S CONTRACTURE: A TEN-YEAR COMPARISON STUDY

Sinolichka Djambazova Zdravkovska, Ilina Gadjevska Tomulevska
Zan Mitrev Clinic, Skopje, North Macedonia

Introduction: Dupuytren's contracture is a progressive fibroproliferative disorder affecting the palmar fascia, often leading to significant functional impairment in advanced stages. While open fasciectomy has been the traditional surgical approach for stage IV disease, percutaneous needle fasciotomy (PNF) offers a minimally invasive alternative. This study compares the long-term efficacy, recovery times, and complication rates of PNF and open fasciectomy over ten years to determine the optimal approach for treating stage IV Dupuytren's contracture.
Aim: To evaluate and compare the outcomes of percutaneous needle fasciotomy (PNF) and open fasciectomy in stage IV Dupuytren's contracture, focusing on long-term efficacy, recovery times, and complication rates.
Material & Methods: A total of 218 patients diagnosed with stage IV Dupuytren's contracture (Tubiana classification) were included in this retrospective study. Group I (PNF) underwent minimally invasive treatment, while Group II (open fasciectomy) underwent traditional surgical intervention. Postoperative rehabilitation for both groups included stretching, exercises, and extension splinting. Follow-up evaluations were conducted preoperatively and postoperatively at one, four, eight, and twenty-four weeks, and annually at two, five, seven, and ten years. Key metrics included pain resolution, healing time, recurrence rate, complications, and functional recovery.
Results: Patients treated with PNF exhibited faster recovery times and fewer complications. Local pain resolved within two days, with complete healing in three days, and return to work achieved within one week. PNF group complications included one recurrence and two infections, with no cases of flexor tendon lesions, scar formation, or palpable cords. The open fasciectomy group experienced prolonged pain resolution (four days), complete healing in 14 days, and a higher complication rate, including seven skin ruptures, two hematomas, and two infections. Four cases of recurrence were observed over ten years. Despite these differences, both groups achieved comparable functional outcomes.

Conclusions: PNF demonstrates significant advantages over open fasciectomy, including faster recovery, fewer complications, and comparable long-term efficacy in managing stage IV Dupuytren's contracture. Its minimally invasive nature and reduced recovery time make it a cost-effective, patient-friendly alternative to traditional surgical methods.

A-0496 TREATMENT OF FIREWORKS-RELATED HAND INJURIES BY PLASTIC SURGEONS: A FIVE-YEAR OVERVIEW

E.S. Smits[1], L de boer[2], A van de Kar[3], S.J.P. Schnitzler[1]
[1]Erasmus MC, Rotterdam, The Netherlands; [2]Rijndam Rehabilitation, Rotterdam, The Netherlands; [3]OLVG, Amsterdam, The Netherlands

Introduction: Despite various education campaigns, the number of fireworks victims requiring specialized care remains high. Plastic surgeons note not only an increase in the number of young people among the victims, but also an increasing trend in serious injuries caused by illegal fireworks such as the Cobra-6.
Aim: The aim of this study is to provide an overview of the population of fireworks victims with hand injuries treated by plastic surgeons around the turn of the year from 2019-2020 through 2023-2024.
Material & Methods: The Dutch Society for Plastic Surgery (NVPC) has been recording data related to fireworks injuries for many years. Since the turn of the year 2019-2020, patient data of fireworks victims with hand injuries were systematically recorded by members of the NVPC. Data such as age, sex, type of fireworks, period of setting off, injury characteristics (e.g. severity and location) and the treatment method used were recorded. Serious injury was defined as the amputation of one or more fingers, the thumb, or the entire hand.
Results: Between the 2019-2020 and 2023-2024 turns of the year, an average of 49 patients per year were treated with fireworks-related hand injuries by plastic surgeons. Of these, an average of 43% were minors, and the average age of victims was 22.8 years. Serious injuries occurred in an average of 37% of victims, 46% of whom were minors. The percentage of serious injuries caused by the Cobra-6 increased significantly, from 23% in 2019-2020 to 62% in 2023-2024. Annually, in an average of 81% of the victims, the fireworks had been set off by the patient himself. During the 2020-2021 turn of the year, strict COVID measures were in place and we saw a sharp decrease in injuries, which increased again in the following years. The number of registered victims injured by the Cobra-6 increased over the past 5 years. Of these victims, 42% were under the age of 16
Conclusions: The number of fireworks victims treated by plastic surgeons remained almost constant over the past decade. Notable is the increasing severity of injuries and the decreasing age of victims, with the Cobra-6's share of serious injuries increasing.

A-0497 SEPTIC ARTHRITIS AFTER A CAT BITE TO THE HAND AND THE NEED FOR JOINT RECONSTRUCTION SURGERY

Inês Domingues, Rui Cunha, João Gameiro, Tomás Nunes, Guilherme Silva, João Neves
Hospital Ortopédico Sant'Iago do Outão, Unidade Local de Saúde da Arrábida, Setúbal, Portugal

Introduction: While most animal bites are clinically trivial, cat bites may result in serious sequelae if not treated appropriately. Delayed presentation may lead to significant morbidity or even mortality. Cat bite injuries to the hand can progress to serious infection, which may need hospitalization, intravenous antibiotic therapy and operative treatment. When there is affection of a joint, causing septic arthritis, cartilage destruction develops within 24 to 48 hours after infection, according to studies, often resulting in disfunction of the joint. Arthroplasty may be a solution to recover joint

mobility after septic arthritis sequelae on metacarpophalangeal or interphalangeal joints.
Case presentation: The authors present the case of a 49-year-old woman with history of diabetes who presented to the emergency room after suffering a cat bite to the hand one month prior. She had previously resorted to a primary health care centre where antibiotic therapy was initiated, with no clinical benefit. On the physical exam, she presented a painful and swollen metacarpophalangeal joint of the index finger of the right hand, with mobility limitation. The radiological examination revealed periarticular osteopaenia and joint space narrowing. She posteriorly performed a CT scan and MRI which confirmed articular effusion with signs of osteomyelitis and articular surface destruction. Afterwards, she was directed to an Orthopaedics urgent consultation where surgical treatment was proposed. She was submitted to debridement of the joint and interposition of antibiotic-loaded bone cement. Three months later, after good clinical evolution with no signs of infection, she was submitted to surgery for removal of the cement and metacarpophalangeal joint arthroplasty with a silicone implant. Posteriorly, physiotherapy was initiated with progressive restoration of the joint mobility. There were no signs of recurrence of the infection
Conclusions: Septic arthritis is a serious condition that may result from cat bites to the hand. Early diagnosis and treatment are warranted in order to avoid complications such as joint destruction or spreading of the infection. Hospitalization, intravenous antibiotics and surgical debridement may be indicated in these situations. When there is a delayed presentation, there may be sequelae of the infectious process such as stiffness of the joint, due to articular destruction, and reconstruction surgery might be necessary to restore its function. In these cases, after an initial debridement of the joint and resolution of the infection, a second stage procedure with arthroplasty of the affected joint might be a solution.

A-0498 A MAJOR REPLANTATION CASE: RIGHT ARM PROXIMAL 1/3 REPLANTATION

Yasin Canbaz, Oğuzhan Tekin, Furkan Uysal, Özcan Boztepe, Percin Karakol
Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, İstanbul Türkiye

Introduction: Advances in microsurgical techniques have enabled the replantation of amputated limbs, restoring viability and functionality. Major extremity replantations, though less common than those of hands or fingers, follow similar principles but include some technical differences. These procedures aim to reimplantation the amputated limb to assist with daily activities alongside the unaffected limb.
Aim: This report presents a case involving the replantation of a 42-year-old male's right arm, amputated at the proximal 1/3 level due to a dozer bucket injury, highlighting the challenges and solutions encountered during management.
Material & Methods: A 42-year-old male was referred after a traumatic amputation of the right arm caused by a dozer bucket blow. The amputation occurred just distal to the deltoid insertion and had extended to the mid-arm level. Examination revealed avulsion injuries, thrombosed vascular ends, and stretched neurovascular structures, with no appearance of pulsatile bleeding. The patient, whose dominant hand was the right side, reported no prior medical conditions, surgeries, or medications. The amputated limb had been properly preserved; however, it sustained crush injuries from the impact. Cold ischemia time was 4 hours, and warm ischemia was 1 hour. X-Ray confirmed a complete transverse fracture only 5 cm distal to the shoulder joint. The MESS was calculated as 8. Since there were no other injuries or contraindications, emergency replantation was planned after obtaining informed consent from the patient and their family. Following anesthesia, extensive debridement, irrigation, and identification of neurovascular structures were performed. Bone shortening facilitated proper alignment and fixation of the stump and amputated limb. The brachial artery gap was bridged using a saphenous vein graft, and microsurgical repair was conducted with 8/0 ethilon. Additionally, three veins were repaired. The ulnar and radial nerves were repaired epineurally at segments with healthy fascicular structures. Bone

shortening allowed direct primary repair of neurovascular structures, eliminating the need for additional nerve or vein grafts. Muscle and skin repair followed, and a penrose drain, plaster splint, and dressing were applied. The patient was transferred to the intensive care unit (ICU) for close monitoring. During ICU follow-up, the patient received 10 units of erythrocyte suspension to stabilize their condition. At 24 hours postoperatively, inadequate capillary circulation in the fingertips and systemic deterioration necessitated emergency reoperation. Necrotic muscle tissue was debrided, and the vascular anastomosis area was released, thus circulation began again. Despite these efforts, by the 72nd postoperative hour, systemic deterioration, including renal failure and risks to other vital systems, worsened due to the crush injury. A joint decision was made with intensive care specialists to perform mid-arm amputation, which was completed successfully.
Conclusions: Major replantations present significant challenges due to the amount of muscle tissue involved, necessitating shorter ischemia times and more aggressive surgical management. Early arterial anastomosis, bone shortening, and thorough debridement are essential to mitigate complications. Postoperative monitoring must be meticulous, and interventions must prioritize patient survival. Even when emotionally challenging, decisions such as re-amputation should be made with a professional approach to prevent systemic failure and ensure the best possible outcome for the patient.

A-0500 TEMPERATURE TRENDS IN DIGITAL REPLANTATION: CAN THEY PREDICT FAILURE?

Judith Doeringer, Esther Voegelin
Inselspital Bern, Switzerland

Introduction: Since the 1970s, monitoring temperature in digital replantation has been a standard practice, widely believed to aid in identifying failing digits. However, there is limited evidence to substantiate the value of these time-intensive measurements. This retrospective study aims to evaluate successful and unsuccessful digital replantations by comparing both absolute temperature values and temperature differences relative to a control finger.
Methods: This retrospective, monocentric, case-control study included all patients who underwent digital replantation procedures at the University Hospital Bern between 2019 and 2023. Out of 44 patients, sufficient data was available for 36, enabling the comparison of 48 replanted fingers. Among these, 37 digits survived, while 11 failed. Absolute temperatures of the operated fingers were recorded at intervals of 6, 12, 18, 24, and 36 hours, as well as on days 3 and 4 post-surgery. Additionally, the temperature differences between the replanted finger and a control finger were analyzed at each time point.
Results: In the first 18 hours, there was no significant difference in absolute temperatures between successful and failed replantations. However, from 24 hours post-surgery until day 3, successfully replanted digits maintained a higher temperature, averaging 1.7 degrees warmer. Comparing the temperature differences between replanted and control fingers, a notable divergence was detected at 12 hours post-surgery. From this point up to day 3, failed fingers were, on average, 2.8 degrees cooler than the control, whereas successful replantations showed only a difference of minus 0.7 degrees. The lowest recorded relative temperature for surviving digits was -6.8 degrees, while it was -6.0 degrees for failed digits, with the minimum absolute temperature in both groups being 29.7 degrees.
Unfortunately, only nine cases had available temperature data immediately before and after revision surgery, which limited the ability to perform a statistically valid analysis for this subgroup.
Conclusion: Temperature monitoring remains a valuable tool in assessing the success of digital replantations. Nonetheless, this study did not identify a specific absolute temperature, temperature differential or threshold capable of reliably predicting replantation failure.

A-0501 SUBACUTE DRUJ DISLOCATION FOLLOWING A DISTAL RADIUS FRACTURE

Grey Giddins, Tristan Fraser, Rob Lambert
Royal United hospital, Bath, BA1 3NG, UK

Introduction: Distal radio-ulnar joint instability following distal radius fractures is increasingly recognised. The majority of these injuries are asymptomatic, however a small minority of patients have marked early instability which can lead to gross subluxation and even dislocation.
Aim: The aim of this study is to report the clinical and radiological features, treatment and outcomes of a series of patients with subacute DRUJ instability soon after a distal radius fracture.
Methods: A retrospective case series examining patients aged ≥12 years who suffered sub-acute marked DRUJ instability following distal radius fractures. Analysis included review of patient demographics, initial management, timings of diagnosis, treatment given and outcomes with quick DASH and PRWE scores at a minimum of 1 year. Radiographically we analysed fracture patterns and association with ulnar styloid fractures
Results: There were 12 patients with a range of different fracture patterns including simple and complex fracture patterns as well as extra- and intra-articular fractures. Patients underwent a variety of operative and non-operative management options. In all cases the DRUJ subluxed >50% or dislocated and always caused a marked loss of forearm supination. Following treatment, in all cases with marked pain this reduced substantially following reduction of the DRUJ. At a minimum follow-up of one year the median qDASH score was 6.82 (range 0 – 72.73) and a median PRWE of 10.75 (range 0 – 84.5). Grip strength was 72% (range 40-95%). There was no association with ulnar styloid fractureConclusions: This study demonstrates that distal radio-ulnar joint instability following a distal radius fracture is not predictable, occurring at all ages and will all patterns of fracture and treatment. We recommend urgent immobilisation with operative or non-operative treatment to reduce the DRUJ and improve outcomes

A-0502 MANAGEMENT OF PERIPROSTHETIC FRACTURES AROUND A TOTAL WRIST ARTHROPLASTY: EXPERIENCES OF A TERTIARY REFERRAL CENTRE

Ashley Newton, Daniel Brown
Liverpool University Teaching Hospitals, UK

Introduction: The Motec Total Wrist Arthroplasty (Swemac Innovations, Linkoping, Swe) is an implant consisting of uncemented titanium screws inserted into the radius and the third metacarpal and a ball and socket bearing in between. The screw design provides initial implant stability, but long-term fixation requires osseointegration of the components, similar to uncemented arthroplasty of other joints.
Periprosthetic fracture around the implant is a rare but challenging complication which can significantly affect implant survival and function.
Aim: To describe our experience of managing this complication in a tertiary referral setting and combine this with evidence from the literature to provide a suggested treatment algorithm.
Materials and Methods: All cases of periprosthetic fracture around a total wrist arthroplasty were identified from a prospectively collected database and the published literature. Details of each case and management plans were assessed to inform the suggested treatment strategy.
Results: Eight periprosthetic fractures were identified from 2017-2024. Seven involved the metacarpal, and one was proximal to the radial component. Most metacarpal fractures (5 of 7) occurred within 6 months of primary surgery and all within 2 years.

Two metacarpal fractures occurred around well-fixed metacarpal components and were treated with open reduction-internal fixation (ORIF) with plate and screws. Three occurred around non-integrated components, two were treated with revision of the metacarpal screws and the other with revision of the screw into the second metacarpal and ORIF of the third metacarpal. One patient had a failed ORIF with persistent non-union and the second metacarpal was too narrow for an implant. This was treated with two stage reconstruction and bone grafting. One patient died of unrelated caused prior to surgery. The radial fracture was minimally displaced and was treated non-operatively.
Conclusion: Our experience and that from others allow us to make some recommendations.
Management should follow principles adopted from lower-limb arthroplasty.
In general, fractures that occur intraoperatively are stable and can be managed expectantly. Well-fixed implants should be retained and if non-displaced initially trial non-surgical management, with subsequent ORIF if displacement or non-union occur. Fractures can be plated in-situ if undisplaced but need to be reduced if displaced (flexed). Smaller bone size makes uni-cortical screws less practical and cable type fixation unpredictable, probably due to the effect on blood supply. Instead, where fixation is required, we advocate plates, from carpus to distal metacarpal, which span both the fracture and the implant.
Fractures resulting in loosening or around a non-integrated (loose) implant necessitate revision of the component. If this does not provide sufficient fracture stability then supplementation with ORIF using a T-shaped plate, to get fixation either side of the metacarpal implant proximally and distal to the implant, is required. If the fracture is too distal consider relocating the metacarpal component to the second metacarpal and treating the fracture separately.
Treatment of periprosthetic fractures around a total wrist arthroplasty is complex but with experience can allow revision surgery which maintains movement.

A-0503 CARPAL INJURIES ASSOCIATED WITH DISTAL RADIUS FRACTURES: ARTHROSCOPIC - TOMOGRAPHIC CORRELATION

Agustina Laboranti[1], Alejandro Meritano[1], Geronimo Chamorro[1], Franco Cassera[1], Octavio Perez[1], Emanuel Ronconi[1,2], Martin Caloia[1,2], Hugo Caloia[1,2]
[1]Hospital Universitario Austral, Buenos Aires; [2]Sanatorio Mater Dei, Ciudad de Buenos Aires, Argentina

Introduction: The distal radius fracture represents one of the most common fractures. Associated intercarpal ligament injuries have been reported to occur in 70% of patients with those fractures. Early recognition and proper management of these injuries may be helpful in predicting and preventing development of the chronic wrist disabilities.
Aim: The purpose of our study was to determine tomographic and arthroscopic correlation
Material & Methods: We retrospectively analyzed 146 patients with distal radius fractures who were surgically treated with arthroscopic assistance. Preoperative computed tomography of the wrists were examined. We evaluated the TFCC ligament injuries, intercarpal ligament and osteochondral injuries; carpal bone fractures, according to previously established imaging criteria, being arthroscopy the gold standard diagnosis. The diagnostic accuracy of tomography for these different lesions was determined.
Results: The sensitivity of tomography for TFCC ligament injuries was 84%, specificity was 65%, average positive predictive value (PPV) was 77% (IC 68 – 84%) and negative predictive value (NPV) was 10% (IC 1 – 32%). The scapholunate injuries sensitivity was 61%, specificity was 62%, PPV 60% (IC 47 – 71%) and NPV 63% (IC 51 – 74%). The sensitivity of osteochondral was 55% and specificity was 87%, PPV 22% (IC 7,5 – 43%) and NPV 97% (IC 92 – 99%).
Conclusions: There was no statistically significant difference between tomography and arthroscopy to preoperatively diagnose intercarpal injuries associated with distal radius fracture.

A-0504 ARE DORSAL CARPAL FRACTURE DISLOCATIONS OF THE WRIST SUPINATION INJURIES?

Grey Giddins
Royal United hospital, Bath

Introduction: Fracture subluxations are uncommon but severe injuries. Understanding the biomechanics should help progress treatment

Aim: The aim of the study was to assess whether distal radial fracture dislocations are supination injuries

Methods: We reviewed the radiographs of dorsal carpal dislocation and fracture dislocations of the wrist from published scientific papers. On the postero-anterior radiograph we hypothesised that the carpus would be rotated/oblique or when the carpus was not mal-aligned there would overlap of the distal radius and ulnar head. On the lateral radiograph we hypothesised the following features: the ulna head would be rotated compared to the standard image and the ulnar styloid dorsal would be dorsal and not in the midline; the ulnar head would be in line with the carpus and dorsal to the mid axis of the radius; and the distal radial shaft will look rotated. We used the Dumontier grading to assess severity.

Results: There were 17 sets of radiographs that could be assessed from nine published papers. On the PA radiographs the carpus was clearly rotated in 6 (35%) and when the carpus was not rotated there was overlap of the distal radius and ulnar head in 5 (29%). On the lateral radiographs the ulnar head was colinear with the carpus in only six cases and appreciably dorsal to the line of the radius in 11 (65%). The position of the ulnar styloid on the lateral radiograph was dorsal in ten of 11 cases where it was not fractured and displaced or too small to assess. The ulnar head was appreciably rotated in 13 (76%) cases and the radius was rotated in 13 (76%) cases.

Conclusion: Radiographs of wrist dorsal fracture dislocations clearly indicate that the large majority of these are supination injuries. This matters in assessing the mechanics of these injuries and planning their treatment.

A-0505 IDENTIFYING AN 'IDEALISED' SINGULAR CENTRE OF ROTATION OF THE WRIST TO OPTIMISE SURGICAL POSITIONING OF A BALL AND SOCKET JOINT REPLACEMENT

Joanna Glanville[1], Karl T Bates[1], Sebastiano Fichera[1], Ashley Newton[2], Daniel Brown[1,2]
[1]University of Liverpool, UK; [2]Liverpool University Hospitals, UK

Introduction: Total joint replacements, such as those in the hip or knee, aim to recreate normal anatomy. The rationale being that maintaining normal anatomy will retain normal biomechanics and thus improve outcome. At the wrist joint, anatomical mimicry is less straightforward and total wrist arthroplasty (TWA) prostheses tend to simplify the complex anatomic structure to a single articulation. Most TWA designs aim to mimic anatomy utilising an ellipsoidal articulation that is similar in shape and placement to the radiocarpal joint. An alternative, the Motec TWA (Swemac Innovations, Linkoping, Swe), uses a ball-and-socket design that aims to restore wrist function rather than replicate anatomy. However, this fixes the wrist centre of rotation (COR) to a single point.

The COR of the native wrist is not fixed; rather, it shifts depending on the type of motion being performed. The consensus is that the COR is within the capitate head but is 5-10 mm more distal during radioulnar deviation (RUD) than during flexion/extension (FE) and moves between those points during the functionally important dart thrower's motion (DTM). There is no consensus as to COR during circumduction. The Motec ball and socket TWA can have the components positioned more proximally or distally depending on surgical technique, so establishing the ideal centre of rotation has a strong clinical relevance.

Aim: To identify the COR of the anatomic wrist during the different in-plane and coupled movements of the wrist and

identify an 'ideal' fixed centre for the placement of a ball-and-socket TWA.
Material & Methods: Validated protocols of active motion simulation and X-Ray reconstruction of moving morphology were used to measure wrist range of motion and tendon forces in 14 cadaveric specimens, during FE, RUD, DTM and circumduction, before and after a ball-and-socket TWA. Anatomic centres were predicted using a functional COR algorithm.
Results: The COR of the wrist varies with different wrist movements. The mean RUD centre was distal to the mean FE centre, explained by the different radii of curvatures of the radiocarpal joint in the coronal plane and the midcarpal joint in the sagittal plane. Circumduction centre was similar to that of FE and showed the least variation over the 14 specimens. During DTM the median predicted COR moved proximally, radially and volarly, passing close to the more static circumduction COR
Conclusions: The COR of the native wrist varies during all wrist movements and therefore reducing the COR to a single fixed point will involve a compromise. The COR of the wrist during circumduction is relatively fixed and lies close to the FE COR and on the line of the COR for DTM. This position, slightly volar to the long-axis of the capitate, and approximately 3mm from the proximal articular surface, would seem to be the 'ideal' singular COR for a ball-and-socket TWA.
Significant errors in TWA implant positioning can lead to poor function. Further investigation is required to determine if placement of the TWA's COR in this position optimises the range and efficiency of movement with this prosthesis.

A-0506 INVESTIGATION INTO THE RELATIONSHIP BETWEEN POSITION OF THE CENTRE OF ROTATION OF A TOTAL WRIST ARTHROPLASTY AND MOVEMENT AND EFFICIENCY OF THE WRIST: A CADAVERIC STUDY

Joanna Glanville[1], Karl T Bates[1], Sebastiano Fichera[1], Ashley Newton[2], Daniel Brown[1,2]
[1]University of Liverpool, UK; [2]Liverpool University Hospitals, UK

Introduction: Most total wrist arthroplasty (TWA) designs aim to mimic anatomy utilising an ellipsoidal articulation that is similar in shape and placement to the radiocarpal joint. An alternative, the Motec TWA (Swemac Innovations, Linkoping, Swe), uses a ball-and-socket design that aims to mimic wrist function rather than anatomy, however this reduces the wrist centre of rotation (COR) to a single fixed point.
The COR of the wrist is not fixed; rather, it shifts depending on the type of motion being performed. A previous study identified an 'idealised' singular COR for a ball-and-socket TWA as a point slightly volar to the long-axis of the capitate, and approximately 3mm from the proximal articular surface.
Aim: To investigate the effect of the placement of the COR of a ball-and-socket TWA on movement and efficiency of movement; to identify the optimal position; and determine if this is co-located at the 'idealised' position identified in a previous study.
Material & Methods: Validated protocols using active motion simulation and X-Ray reconstruction of moving morphology were used to measure wrist range of motion and tendon forces in 14 cadaveric specimens, during in-plane and coupled movements, before and after a ball-and-socket TWA. In five specimens COR was shifted proximally and distally from 'standard' using custom made implants into a total of six positions. COR was predicted using a functional algorithm for the anatomic wrist and geometrically for the post-TWA wrist. Anatomic and post-TWA ROM and tendon forces were compared and regressed with the position of COR for each trial.
Results: Mean post-TWA centre is proximal to the anatomic centre in all motions, from 4 mm proximal in flexion/extension (FE) to 11 mm in radio-ulnar deviation (RUD).
In the 14 trials where the Motec was placed in the 'standard' position, we did not find proximal/distal COR shifting to significantly affect post-operative change in the ranges of FE, RUD or dart-thrower's motion (DTM). Only when shifts were more extreme (with the custom-made implants placing the COR into a deliberately 'wrong' position) was there a

significant change in movement. Further, the frequency of impingement increased as COR was shifted distally.
Shifting away from the long axis of the radius (LAR) in the coronal plane causes increased radial deviation if shifted ulnarly, and vice-versa. Similar relations occur in the sagittal plane with dorsal positioning facilitating extension. In both planes the optimal COR lies within 2mm of the LAR.
Conclusions: The mean COR of the Motec wrist is proximal, radial, and dorsal to the 'ideal' anatomic position. Proximal/distal shifting of Motec COR has the largest effect on extension dominated motions with optimal movement and efficiency occurring with the COR 5-10 mm distal to the radial articular surface in an averagely sized wrist. This correlates with the position attained with standard surgical technique. Positioning of the COR of the Motec TWA does influence movement and efficiency, although placement seems to be forgiving for errors of <5mm from 'standard'.

A-0507 A STUDY ON BONE UNION IN ARTHRODESIS FOR THUMB CARPOMETACARPAL OSTEOARTHRITIS: COMPARISON OF FIXATION METHODS (PLATE VS. SCREW)

Akinobu Tsuchihashi, Michiro Yamamoto, Katsuyuki Iwatsuki, Hidemasa Yoneda, Katsuhiro Tokutake, Masaomi Saeki, Atsuhiko Murayama, Hiroaki Iwase, Sota Saeki, Keiichiro Nishikawa, Hirotaka Sugiura
Department of Human Enhancement and Hand Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan

Introduction: Surgical procedures for CM arthropathy in the first metacarpophalangeal joint include arthroplasty and arthrodesis. Arthrodesis gives stable results, but the implants used for fixation vary. Much depends on surgeon preference. Studies of nonunion rates according to fixation methods are common, but there is no literature comparing bone healing time
Aim: To compare the effects of plate and screw fixation on bone union time in arthrodesis of carpal metacarpal (CM) osteoarthritis of the thumb
Material & Methods: We included 50 cases (59 thumbs) of thumb CM osteoarthritis who underwent arthrodesis between October 2012 and March 2024, with a follow-up of six months or more. Plate fixation was used in 25 thumbs (P group) and screw fixation in 24 thumbs (S group). The primary outcome was time to bone union, with secondary outcomes including age, sex, mean follow-up, delayed union, definitive union, HAND20 and VAS pain scores (preoperative, postoperative at 1 year, and final follow-up), and need for revision. Bone union was assessed using frontal and lateral radiographs, and delayed union was defined as failure to achieve union within six months
Results: The P group included 9 male and 16 female thumbs with a mean age of 60.0 ± 8.7 years and a mean follow-up of 30.0 ± 16.3 months. The S group included 8 male and 16 female thumbs with a mean age of 61.3 ± 7.4 years and a mean follow-up of 52.3 ± 32.6 months. Time to bone union was 7.57 ± 5.45 months in the P group and 8.94 ± 9.61 months in the S group, with no significant difference between groups ($p = 0.58$). Delayed union was observed in 11 cases in the S group and 8 cases in the P group, with no significant difference ($p = 0.561$). Final union was achieved in 22 cases in the P group and 18 cases in the S group. Reoperation was required in 2 cases in the P group and 3 cases in the S group ($p = 0.66$). HAND20 and VAS pain scores showed significant improvement from preoperative values in both groups, with no significant difference between groups at any time point.
Conclusion: In arthrodesis for CM osteoarthritis of the thumb, there was no significant difference between plate fixation and screw fixation in terms of time to bone union or final union rates, with both fixation methods showing favorable treatment outcomes. In addition, improvements in HAND20 and VAS pain scores demonstrated functional and pain relief effects in both groups. As implant standardization was not achieved in this study, further inter-institutional case accumulation and detailed inter-implant comparisons are needed in the future.

A-0509 EXPLORING THE RELATIONSHIP BETWEEN CAREGIVER BURDEN AND QUALITY OF LIFE IN FAMILIES OF CHILDREN WITH CONGENITAL BRACHIAL PLEXUS INJURY

Sebahat Aksoy, Elif Cimilli, Özge Buket Arslan
Hacettepe University, Faculty of Health Sciences, Department of Occupational Therapy, Turkey

Introduction: The role of the family in pediatric rehabilitation is of great importance, yet the care of children with chronic conditions such as congenital brachial plexus injury (CBPI) can present significant challenges to family well-being. A review of the literature reveals that mothers of children with CBPI are prone to experiencing elevated levels of depression, anxiety, emotional exhaustion, and detachment, particularly in cases where the condition is severe. In addition to the personal and emotional strains that families may experience, CBPI may have significant psychosocial and financial implications.
Aim: The objective of this study is to examine the relationship between caregiver burden and quality of life in caregivers of children with CBPI.
Material & Methods: The study sample comprised 21 primary caregivers of children aged 0-2 years diagnosed with CBPI, recruited from a pediatric rehabilitation clinic. Inclusion criteria required caregivers to be between 18 and 65 years of age, to have lived in the same household with the child for a minimum of six months, and to be primarily responsible for the child's care. Caregivers with diagnosed neurological, psychiatric, or systemic illnesses, who work part-time or full-time, who have a child other than the child with a CBPI diagnosis, who are divorced or widowed, and who care for an individual other than the child were excluded. Data on caregiver burden and quality of life were collected using two validated tools in Turkish: The Adult Carer Quality of Life Questionnaire (AC-QoL) and the Zarit Burden Interview (ZBI). The relationship between the AC-QoL and ZBI scores was assessed using the Spearman correlation coefficient, calculated with the SPSS 21 program.
Results: All caregivers included in the study were female, with a mean age of 33.57 ± 4.93 years (range 26 to 46 years). The mean AC-QoL score for participants was 68.66 ± 14.05 (min 37, max 93), while the ZBI score was 34 ± 13.19 (min 15, max 68). A significant correlation was observed between the AC-QoL and the ZBI scores ($r = -0.535$, $p = 0.013$).
Conclusions: This study highlights a significant correlation between caregiver burden and quality of life in families of children with congenital brachial plexus injury. The results indicate that caregivers experiencing higher burden levels reported lower quality of life. This emphasizes the necessity for targeted interventions to alleviate caregiver burden. We believe that supportive measures, including psychosocial support and caregiver education, are essential to improve the well-being of caregivers and, consequently, enhance the overall care environment for children with CBPI.

A-0510 KIENBÖCK'S DISEASE – INCIDENCE AND OPERATIONS IN FINLAND: A NATIONWIDE REGISTER STUDY

Krista Wernér[1], Turkka Anttila[1], Timo Viljakka[2], Jorma Ryhänen[1], Sina Hulkkonen[1]
[1]Musculoskeletal and Plastic Surgery, Department of Hand Surgery, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; [2]Tampere University Hospital, Tampere, Finland

This study assessed the nationwide incidence of Kienböck's Disease, and operations performed for Kienböck's Disease from the Care Register for Health Care in Finland 1996-2022. The mean annual total standardized incidence rate per million person-years was 9.60 (95% confidence interval 9.10 to 10.11) and for men and women, 10.38 (95% confidence interval 9.63 to 11.13) and 8.78 (95% confidence interval 8.10 to 9.45), respectively. The incidence rate was highest for 50–59-year-olds, at 15.49. Compared with women, the incidence rate for men was higher across all age groups up to 60–69 years. Altogether, 44% of the patients were operated on, and 19% of them multiple times. Partial arthrodesis was the most performed

procedure, and salvage procedures covered 62% of all operations. Our findings provide comprehensive new evidence about Kienböck's Disease distribution across Finland's population and offer insights into the burden caused by operations.

A-0511 RISK FACTORS FOR KIENBÖCK'S DISEASE AND OPERATIONS: A NATIONWIDE REGISTER STUDY FROM FINLAND

Krista Wernér[1], Turkka Anttila[1], Timo Viljakka[2], Jorma Ryhänen[1], Sina Hulkkonen[1]
[1]Musculoskeletal and Plastic Surgery, Department of Hand Surgery, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; [2]Tampere University Hospital, Tampere, Finland

This study was designed to determine the risk factors for Kienböck's disease and the need for surgery. Patients with Kienböck's disease and possible predisposing factors were obtained from multiple nationwide Finnish registers in 1996-2022. Men were more often affected and had higher risk for operations, IRR=1.24 (95% CI=1.15 to 1.33) and RR=1.16, respectively. Many previously known risk factors for other avascular necrosis were found to be associated with Kienböck's disease such as alcohol abuse (OR=1.67), rheumatic diseases (OR=1.81), coagulopathic state (OR=1.59), and history of hand and wrist injuries (OR=3.03). Operated patients had a higher prevalence of type 1 diabetes (OR=2.43) and coagulopathic risk factors (OR=1.40). Patients requiring total arthrodesis had a higher prevalence of immunosuppression (OR=1.77), cardiovascular risk factors (OR=2.31), alcohol abuse (OR=2.13), rheumatoid arthritis (OR=3.74), pancreatitis (OR=3.03), and hypertension (OR=1.94). This study provides information on factors associated with Kienböck's disease and factors possibly affecting disease severity.

A-0512 TOE-TO-ANTEBRACHIAL STUMP TRANSPLANTATION (VILKKI'S PROCEDURE) AFTER BILATERAL HAND AMPUTATION IN A PAEDIATRIC PATIENT

Wenceslao Calonge, Kadio Koakou-Adonis, Constantin Yao, N'Da Assie, Henri Asse, Patrick Meredith
Centre de Chirurgie Reconstructive, Abidjan, Côte d'Ivoire

Introduction: Mechanical or electromechanical prostheses are usually seen as the unavoidable consequence of total hand amputation. However, in our age of refined devices and bionic advancements it must be sadly acknowledged that more than two thirds of humanity do not have access to expensive health care or even basic surgery.
Aim: Presenting a successful application of the "historic" Vilkki's procedure in a lower-income country.
Material & Methods: As a result of rope strapping of both wrists by his stepfather, a 9-year-old boy suffered from necrosis and loss of both hands. On the right side the amputation line crossed the carpo-metacarpal line. On the left limb there was an absence of the distal two thirds of the forearm which made unappropiate the choice of a Krukenberg procedure but the stump included most of the origins of carpal flexors and extensors. After informed consent from the mother of the patient, the authors proceeded to a microsurgical reimplantation of the second toes on each side with skin grafts in a sequence of two free toe transfer procedures in a 8-month period at the age of 12 years.
Results: The two procedures did not present any complication or morbidity of the donor areas. The patient intensely engaged in rehabilitative therapy and he reached grasping and writing with both hands. After Vilkki's procedure was carried out on the left antebrachial stump the patient was able to use a pencil and to function as ambidextrous for certain tasks. The left limb is now dominant for writing functions. He rejoined schooling and has recently accomplished a training as a car repairer.
Conclusions: The procedure described by the Finnish surgeon Simo Vilkki in 1983 may be always kept in mind as an option in destitute settings. It does not prevent adaptation of an electromechanical prosthesis.

A-0513 ADDRESSING HUMAN FACTORS TO ENHANCE MANAGEMENT OF FLEXOR SHEATH INFECTIONS: INSIGHTS FROM A TWO-CYCLE AUDIT AT A REGIONAL HAND UNIT

Rachel Phing Ho, Robert Slade, John Dickson
Department of Plastic Surgery, Derriford Hospital, Plymouth

Introduction: Flexor Sheath Infections (FSI) have the potential of severe morbidity. With effective management the patient should regain functional range of motion. Effective management relies on multidisciplinary coordination and communication.
Aim: This audit aims to evaluate compliance with the British Society for Surgery of the Hand (BSSH) guidelines and explores the human factors influencing delivery of care.
Material & Methods: An audit over two 6-month cycles was done from March 2023 to August 2024. Cycle 1 reviewed the practices prior to implementing changes looking at systemic and human factor barriers. Cycle 2 assessed the impact of our intervention. The audit included 25 patients and focused on theatre access time, antibiotic administration, access and time to hand therapy post washouts. Data was collected retrospectively from electronic patient records and analysed in Microsoft Excel. Interventions included the introduction of an electronic operation note template for flexor sheath washout and standardised patient education material.
Results: The electronic template helped standardise documentation of follow up planning. Documentation of need for hand therapy increased from 7% at cycle 1 to 92% at cycle 2. This resulted in an increase from 53% to 67% attendance of hand therapy post flexor sheath washout. However, there was still variability in time from surgery to hand therapy in cycle 2 ranging from 3 to 24 days.
Conclusions: This audit emphasises the role of human factors. By creating an electronic template standardising documentation this improved the referral to hand therapy. However time to therapy remains variable and falls short of the BSSH guidelines. Future efforts will focus on improving communication between departments and involving patients actively in their care to ensure timely treatment and rehabilitation

A-0514 ULTRASOUND-GUIDED SOFT TISSUE REPAIR IN HAND SURGERY: PROPOSAL OF A NOVEL TECHNIQUE

Antonio Brando[1,2]
[1]Centro Ortopedico di Quadrante, Omegna, Italy; [2]Istituto Auxologico - Ospedale Capitanio, Milano, Italy

Introduction: Minimally invasive techniques for the repair of soft tissues in the hand, such as tendons and ligaments, are essential to restore functionality and minimize postoperative complications. Traditional open surgical methods often require extensive dissection, leading to risks like adhesions, scarring, and neurovascular damage. This paper proposes a new approach utilizing ultrasound guidance to enhance precision and reduce invasiveness in soft tissue repair.
Aim: To describe a novel technique for soft tissue repair in the hand under ultrasound guidance, focusing on its anatomical feasibility and its potential to improve surgical accuracy while minimizing trauma to surrounding tissues.
Material & Methods: The proposed technique was developed and tested on anatomical hand models, including cadaveric specimens. High-resolution ultrasound imaging was used to visualize soft tissue structures, locate injury sites, and guide the placement of sutures or other repair tools. Special instruments and materials were chosen to support minimally invasive procedures. The method involved a step-by-step approach for accurate instrument placement, tissue handling, and repair alignment, all performed under continuous ultrasound monitoring. Evaluation focused on visualization quality, repair accuracy, and ease of instrument manipulation.
Results: The use of anatomical models demonstrated clear visualization of soft tissue structures and adjacent anatomy

under ultrasound guidance. Repairs were performed with high accuracy, ensuring proper alignment and minimal disruption to surrounding tissues. The technique proved reproducible and adaptable to various soft tissue injuries, with no damage to neurovascular structures observed. These results support the potential for clinical application in a variety of soft tissue repair scenarios in the hand

Conclusions: This ultrasound-guided approach provides a precise and minimally invasive technique for repairing soft tissues in the hand. The findings from anatomical models indicate that the method is safe, feasible, and versatile, with potential to reduce tissue trauma and improve surgical outcomes. Further studies and clinical validation are required to confirm its benefits and establish it as a standard practice in hand surgery.

A-0515 SOFT TISSUE RECONSTRUCTION AFTER DERMOFASCIECTOMY IN ONE SHOT DEFINITIVE SURGERY OF SEVERE DUPUYTREN'S DISEASE

Belén García-Medrano[1], Elvira Mateos Álvarez[1], Claudia González García[2], David C Noriega González[1]
[1]Hand Surgery Unit Orthopedic Surgery Department Hospital Clínico Universitario de Valladolid, Spain; [2]Upper Extremity Unit, Orthopedic Surgery Department, Hospital Infanta Margarita, Córdoba, Spain

Introduction: Advanced stages of Dupuytren's disease involve significant functional limitations. In critical contractures, conventional treatment does not achieve satisfactory results with difficulties in skin coverage when extending the digit, and secondarily it can be a detriment to the patient in the development of their daily activities.

Aim: To describe the indication of total skin autograft after radical dermofasciectomy in advanced Dupuytren's contracture in active patients to achieve a more functional result.

Material & Methods: This is a prospective cohort study of all consecutive active patients, diagnosed of Dupuytren's contracture Tubiana grade III-IV, with an extension defect of more than 60° at the metacarpophalangeal joint (MCPJ) and more than 90° at the proximal interphalangeal joints (PIPJ) and a well palpable cord in two or three fingers. They were treated by dermofasciectomy, including all the pathological tissue and the skin considering the metacarpophalangeal and proximal interphalangeal areas of the more affected finger. If the contracture was extended to more fingers but with less deformity, only regional selected fasciectomy and skin Z-plasties were performed on the rest ones. The graft to covert the defect was obtained from the antero-internal region of the proximal ipsilateral forearm. The dressing that covered the graft was monitored periodically in the office. We registered epidemiological data, surgical details and follow-up. Patient-reported outcome measures (PROMs) were recorded. Statistical analysis was completed.

Results: We included 20 grafted fingers of 19 patients. 11 of them required a tenoarthrolysis in PIP joint for severe osteoarthritis. The graft size, on average, was 4.1 cm long per 1.9 cm wide. The largest graft used was approximately 5.4 cm by 4.2 cm on the patient with involvement of the 3rd digital web. The anatomical areas structures on which the graft was placed were MP-P1 in 7 fingers, P1-P2 in another 13 cases. One immediate hematoma was the unique adverse event, but the graft reached to survive. Recovery time, until the maximum function, reached of 4,2 months. Their range of movement (ROM) improved 54° on MP joint (80%), with a residual flexion of the PIP joint of 15° (35%), and a persistence PIP joint contracture of 30° (9 cases). No cases of graft failure. Five cases got full ROM. No significant complications at final follow-up were detected. The QuickDASH score improved 9 points from preoperative period. URAM score median result was 11. 85 % would repeat same procedure.

Conclusions: Full-thickness skin grafting after dermofasciectomy is a satisfactory surgical alternative that restores quality of life to active patients with severe Dupuytren's disease. It has been proposed as a mechanism of "firewalls", reaching a functional degree of mobility without significant complications.

A-0516 ADVERSE EVENTS AFTER VLP FIXATION OF DISTAL RADIUS FRACTURES

Henri Vasara[1], Antti Stenroos[2], Petra Tarkiainen[1], Anni Aavikko[2,3], Panu H Nordback[1], Turkka Anttila[1], Jussi Kosola[2], Samuli Aspinen[1]

[1]Department of Hand Surgery, Helsinki University Hospital and University of Helsinki, Finland; [2]Department of Orthopaedics and Traumatology, Helsinki University Hospital, Helsinki, Finland; [3]Department of Surgery, Päijät-Häme Central Hospital, Lahti, Finland

Introduction: 12 to 18% of patients encounter adverse events (AEs) after operative treatment of distal radius fractures (DRFs) with volar locking plates (VLPs). Risk factors to which preventive measures could be targeted are currently limited.
Aim: We aimed to examine the incidence of postoperative AEs and assess the causes and risk factors for the AEs after VLP fixation of DRFs.
Material & Methods: We performed a single-center retrospective cohort study evaluating all adult DRF patients treated with VLP fixation between 2009 and 2019 at Helsinki University Hospital. Patients with previous disabilities or ulnar fractures, other than styloid process, in the affected extremity were excluded. In total, 2790 cases of DRFs were included. We examined each patient's treatment using the electronical medical records system and identified postoperative AEs. We utilized multivariable binary logistic regression to assess the risk for AEs.
Results: The incidence of AEs was 16%. Hardware complications (8.3%), predominantly intra-articular screws (4.9%) were the most commonly encountered AEs. Other frequent AEs included carpal tunnel syndrome (2.8%), tendon complications (2.8%), and surgical site infections (1.5%). In the multivariable analysis, smoking, higher BMI, alcohol abuse, C-type fractures, residual intra-articular displacement, and dorsal tilt were found as risk factors for AEs.
Conclusions: The incidence of AEs was 16% after VLP fixation of DRFs in Helsinki. We identified several new risk factors for AEs including residual dorsal tilt, intra-articular dislocation, smoking, alcohol abuse, and higher BMI

A-0517 MANAGEMENT OF PIP JOINT STIFFNESS AFTER CONVENTIONAL TRIGGER FINGER RELEASE

Belén García-Medrano[1], Elvira Mateos Álvarez[1], Belén Sancho Iglesias[2], David C Noriega González[1]

[1]Hand Surgery Unit. Orthopedic Surgery Department. Hospital Clínico Universitario de Valladolid, Spain; [2]MSc. Hand Bilbao., Bilbao, Spain

Introduction: It is generally accepted that long-term finger triggering eventually leads to a fixed flexion contracture of the proximal interphalangeal (PIP) joint. Degenerative thickening of the flexor digitorum superficialis (FDS) was considered the most important factor related to flexion contracture of the PIP joint secondary to a long-standing trigger finger. But other causes could be the rigidity of the capsule or the volar plate. Some studies have shown that the ultrasound appearance of the flexor tendon, pulley and other extratendinous connective tissues in trigger finger correlates with clinical severity and its evolution.
Aim: The objective of our study is to detect by ultrasound test the immediate postoperative period after tenolysis of trigger finger, searching the cause of PIP joint pain.
Material & Methods: We registered prospectively 30 patients diagnosed of trigger finger after failure of conservative treatment. Thumbs were excluded. We completed a sonographic analysis focused on dimensions of the anterior-posterior thickness of the hypoechogenic bundle including the A1 pulley and flexor tendon (at the metacarpal head–neck junction). We also measured the anterior-posterior thickness of the hypoechogenic bundle of the flexor tendon at the level of proximal phalanx. We repeated them two weeks after conventional open surgical release, with intertendinous adhesions release.

Results: We compared conventional postop follow-up of a group of 15 patients who started to move the finger the same day of surgery with a soft bandage, with another 15 with a reglementary protocol of exercises. In the first group, after two weeks, postoperative pain focused on PIP joint, more than palmar injury. 9 patients showed a PIP contracture of more than 20 degrees, 10% less than 15 degrees. Fingers showed peritendinous hypoechogenic rim between flexor tendon and A1 pulley, which seemed to represent the amount of synovial fluid of 2.8 mm. It increased after the first days postop, so as the dimensions of opened A1 pulley after surgery. PIP joint showed a 25% increased thickness of A2 pulley, a collateral ligamentous thickening and capsular dilation with a 30% of increased diameter.
In group 2, the contracture disappeared in all patients except one who required physical therapy. No further surgery was necessary. By ultrasound control, we found a reduction of the peritendinous halo around the flexor proximal to A2, a reduction in the articular volume of the PIP and the thickening of the capsuloligamentous structures. More significantly, a 21% reduction in joint dimensions and complete disappearance of the halo was calculated in those who performed the immediately indicated joint mobilization exercise regimen.
Conclusions: Long-term positional contracture could result in stiffness of the capsule and ligament of the PIP joint and eventual fixed contracture, after conventional trigger finger surgery. These problems of extension lag and stiffness could be caused by flexor tendon adhesion, whose release is a fundamental step in surgery, in addition to opening the pulley. Early indications of moving and massage get to solve them.

A-0518 DRIVERS OF HEALTH-RELATED QUALITY OF LIFE AMONG CHILDREN WITH BRACHIAL PLEXUS BIRTH INJURY: RESULTS OF THE GUPI (GROWING UP WITH A PLEXUS INJURY) STUDY

Andrea S. Bauer[1], Patricia E. Miller[1], M. Claire Manske[2], Michelle A. James[2], Jenny M. Dorich[3], Kristen M. Davidge[4], Roger Cornwall[3]

[1]Boston Children's Hospital, Boston, MA, United States; [2]Shriners Hospital for Children Northern California, Sacramento, CA, United States; [3]Cincinnati Children's Hospital Medical Center, Cincinnati, OH, United States; [4]The Hospital for Sick Children, Toronto, ON, Canada

Introduction: Brachial plexus birth injury (BPBI) affects many physical and nonphysical aspects of health-related quality of life (HRQoL). However, because these factors are often studied in isolation, the relative impact of these factors on overall HRQoL remains unknown, rendering clinicians unable to focus treatment approaches on the factors that matter most to patients' overall HRQoL.
Aim: The current multicenter study utilized the International Classification of Functioning, Disability, and Health (ICF) as a conceptual framework to (1) evaluate components of HRQoL across all ICF domains of Body Structures, Body Functions, Activity/Participation, and Environment, and (2) determine the relative contributions of these components to overall HRQoL.
Material & Methods: Children aged 8-18yo with BPBI were prospectively enrolled at 4 centers, completing physical examinations guided by iPLUTO consensus (active and passive range of motion, Mallet scores, and Semmes-Weinstein sensory testing), as well as patient-reported outcome measures (PROMs) guided by the ICF, including pediatric PROMIS measures (Global Health, Upper Extremity, Pain Interference, Pain Intensity, Peer Relationships, Family Relationships), PedsQL Emotional Functioning, NeuroQOL Pediatric Stigma, Child and Adolescent Scale of Participation (CASP), and Child and Adolescent Scale of Environment (CASE). PROMs were compared with normative data where available and between upper and global injuries. All physical examination measures and PROMs were tested for correlations with overall HRQoL as measured by PROMIS Global Health. Factor analysis and structural equation modeling were used to group variables into statistically derived factors and to determine interrelationships among those factors.

Results: 207 children (average age 12.1yo, 75% upper plexus injuries) underwent cross-sectional analysis. Mean PROMIS Global Health was significantly lower than the general population at 48.5 (95% CI, 47.3-49.7) but did not differ between upper and global injuries. A high degree of correlations existed among the physical examination measures including ranges of motion and Mallet scores, but these did not correlate with the PROMIS Global Health. The strongest positive correlations with HRQoL were with measures of emotional functioning and family/peer relationships, and the strongest negative correlations were with measures of pain and stigma. Factor analysis identified substantial redundancy among physical examination measures. Structural equation modeling, informed by this factor analysis and by the ICF, identified a model whereby (1) global health was directly impacted by pain and family/peer relationships, (2) family/peer relationships were impacted by stigma, and (3) stigma was impacted by the interrelated domains of body structure and function.
Conclusions: In this BPBI sample, global health correlated directly with psychosocial factors and pain but not with any physical examination parameters, including upper trunk versus global plexus injuries. Therefore, treatment for children with BPBI must extend beyond the physical function of the affected limb. Factor analysis revealed redundancy among many physical examination measures that may inform streamlining the physical assessment of children with BPBI. Structural equation modeling found that body structure and function, the domains relevant to physical function and surgeries, only related to Global Health indirectly though stigma and family/peer relationships. Therefore, surgical decision-making must consider the impact on psychosocial, not just physical, functioning.

A-0519 FOCUS ON VOLAR PROXIMAL INTERPHALANGEAL JOINT FRACTURE-DISLOCATIONS

Belén García-Medrano[1], Elvira Mateos Álvarez[1], David C Noriega González[2]
[1]Hand Surgery Unit. Orthopedic Surgery Department. Hospital Clínico Universitario de Valladolid, Valladolid, Spain; [2]Head of Orthopedic Surgery Department. Hospital Clínico Universitario de Valladolid, Valladolid, Spain

Introduction: These rare injuries are followed by diagnostic errors. They are usually associated with an avulsion fracture of the central band of the extensor tendon, which is considered a highly unstable injury. They represent a surgical challenge due to the difficulty in achieving both anatomical reduction and stable fixation to initiate early mobilization.
Aim: To establish an action protocol for low-incidence injuries with a poor prognosis.
Material & Methods: Intra-articular fractures of the base of the middle phalanx with volar instability are reviewed. Initial data are collected on delay in diagnosis, initial management, clinical signs (cutaneous umbilication, joint blockage), range of motion in proximal and distal interphalangeal joints (PIP and DIP), Elson test, percentage of avulsed articular surface, lateralization of the fracture line in imaging studies. Therapeutic choice, surgical option, range of motion after treatment and complications are recorded.
Results: Only stable fracture-dislocations of the PIP joint are treated with digital orthoses and only immobilizing the PIP joint. Internal fixation achieves better functional results (active ROM of the PIP joint ranged between 55 and 95, mean 81.9), especially the dorsal plates (no differences between hook and standard T plates), plate without pre-bend and as proximal as possible, checking the distal tension of the extensor tendon. ASSH TAM total active motion Score of 75.2%, "good". The main complication is postoperative stiffness of the DIP. Prognosis worsens: late diagnosis, delay in treatment, age, open surgery, size of dorsal avulsion and extent of chondral damage.
Conclusions: The priority is the correct diagnosis. The goals of treatment are to restore joint congruity, achieve anatomical reduction of the articular surface, and early mobilize the stabilized joint.

A-0520 ACCURACY AND PRECISION OF CT-RSA MIGRATION MEASUREMENTS OF A PIP PROSTHESIS COMPARED TO MBRSA: AN ANATOMIC SPECIMEN STUDY

R. Oomen[1], L.A. Koster[2], B.L. Kaptein[2], I.F. Blom[1,3], G.A. Kraan[1], N.M.C. Mathijssen[1]
[1]Reinier Haga Orthopedisch Centrum, Zoetermeer, The Netherlands; [2]Leids Universitair Medisch Centrum, department of orthopaedics, Leiden, The Netherlands; [3]Reinier de Graaf Gasthuis, department of radiology, Delft, The Netherlands

Introduction: Measuring migration of prosthesis in small joints is a real challenge. The current gold standard to measure migration is Roentgenstereometric Analysis (RSA). RSA requires bone markers to measure implant migration. An upcoming method to measure migration is Computed Tomography based RSA (CT-RSA). This method does not require markers, and therefore avoids the difficulties of marker distribution in a small bone. However, the accuracy and precision of CT-RSA have not yet been assessed for migration analysis in small joints.
Aim: The aim of this study is to assess the accuracy and precision of migration measurements of the CapFlex PIP prosthesis using CT-RSA and compare the results with MBRSA.
Materials and Methods: An anatomic specimen of the proximal and intermediate phalanges with an implanted CapFlex-PIP prosthesis (KLS Martin Group, Tuttlingen, Germany) was placed in a micromanipulator. The proximal phalanx was translated along the x-, y- and z-axis (0.0/0.1/0.2/0.3/0.5/0.7/1.0/1.5/2.0/2.5 mm) and rotated around the longitudinal axis (0.0/0.1/0.2/0.5/0.7/1.0/2.0/3.0/4.0/5.0°) in 10 manipulations each. Manipulations were applied for translations and rotations separately. At each position, a CT-scan and set of RSA radiographs were made. All CT-scans were analyzed with V3MA software (RSAcore, LUMC, Leiden, The Netherlands) and all radiographs were analyzed with MBRSA software (RSAcore, LUMC, Leiden, The Netherlands) to calculate translations and rotations of the components compared to the opposing bone. One analyst repeated the analysis after at least one month, and all analyses were performed by two analysts.
Results and discussion: No significant differences were found between the applied manipulation and measured migration for all V3MA variables and MBRSA variables, except for the y-axis translation in the distal component -0.023 mm (95%CI -0.004 – 0.050, p=0.005) measured with V3MA and for the x-axis translation in the proximal component 0.051 mm (95%CI -0.024 – 0.126, p=0.003) and the y-axis rotation in the distal component 1.465° (95%CI 0.090 – 2.841, p<0.001) measured with MBRSA. All variables measured with V3MA had a smaller precision interval compared to MBRSA, except for the Y-axis translation with a precision interval in the proximal component of 0.048 mm for V3MA and 0.033 mm for MBRSA and in the distal component of 0.026 mm for V3MA and 0.020 mm for MBRSA. Intra- and inter-rater reliability was higher for V3MA (ICC: 0.726 - 1.000 (p<0.001), IRR: 0.407 – 1.000 (p<0.001)) compared to MBRSA (ICC: 0.328 - 0.999 (p<0.001), IRR: 0.290 – 0.999 (p<0.001)).
Conclusion: This study concludes that V3MA has a better accuracy, precision, inter- and intra-rater reliability compared to MBRSA and is a valid method to measure migration patterns in the hand.

A-0521 ANALYSIS OF RADIATION EXPOSURE TO DIRECT BEAM TO SURGEON' HANDS FROM IMAGE INTENSIFIERS DURING HAND FRACTURE FIXATION PROCEDURES - A SINGLE CENTRE STUDY

W R P De Alwis, S Kanesu, V Margaj, K Maheshwari, P Patil, S Hindocha, S Anandan
Bedford Hospital, Bedford, United Kingdom

Introduction: Radiation exposure is a main concern for hand surgeons due to frequent use of image intensifiers for fracture fixations. Recommended safety precautions are occasionally neglected, likely due to practical constraints and inconvenience. The purpose of this study was to obtain an estimation of the radiation exposure during hand fracture fixations.

Aim: Gain attention and assess the severity of neglected area of occupational hazard to surgeons of radiation exposure that may give bad consequences later.
Material & Methods: Retrospective descriptive study was conducted at a single centre, evaluating 1260 intensifier images. Presence of the surgeons' hand, the level of beam exposure, the type of bony procedure, the exposure dosage, and the exposure time are recorded.
Results: The parts of the hands of surgeons were identified in 605 out of the 1260 images(48.01%). Approximately 38.7% of the images show exposure up to the distal interphalangeal joint, while exposure up to the proximal interphalangeal joint, metacarpo-phalangeal joint, and carpo-metacarpal joint is observed in 35.48%, 19.35%, and 3.22% of the images, respectively. Out of the exposed cases, 51.61% are percutaneous pining(PCP), 25.8% are Manipulation under anaesthesia, 9.67%,6.45% and 6.45% are Screw-fixation, plate and screw fixation and Intramedullary screws respectively. The average amount of direct radiation exposure per session per surgeon is 0.3383mSv and the duration is 3.8 seconds
Conclusions: Approximately 50% of the time, surgeons' hands are directly exposed to the radiation, dosage is approximately equals to 1.5 chest x-rays per session with the distal parts of their fingers being commonly exposed. PCP and procedures involving the phalanges increases the risk of exposure. It is imperative to enhance the awareness among surgeons to follow protective measures to minimize the exposure.

A-0524 PEDIATRIC PROXIMAL RADIUS FRACTURES HAVE A HIGH COMPLICATION RATE

Kaj Zilliacus[1], Ilkka Helenius[2], Yrjänä Nietosvaara[1,3], Niko Kämppä[1,2], Reetta Kivisaari[1], Petra Grahn[1]
[1]Department of pediatric orthopedics, New Children's Hospital, Helsinki, Finland; [2]Department of Orthopedic and Hand Surgery, University Hospital, Helsinki, Finland; [3]Department of Pediatric surgery, Kuopio, Finland

Introduction: Pediatric proximal radius fractures can be problematic fractures and may lead to functional deficits.
Aim: The aim of this register-based study is to report our institutional complications in pediatric proximal radius fractures in relation to Judet's classification, trauma mechanism and treatment.
Material & Methods: Under 16 years old patients with a proximal radius fracture treated at HUS New Children's Hospital, Helsinki, between 2014 and 2019 were identified from the institutional fracture registry (Kids Fracture Tool). Patient charts and radiographs were reviewed. Patients with primary treatment elsewhere or insufficient patient charts were excluded. Treatment type was assessed, and fractures were classified using Judet (I-IV), Salter-Harris (epiphyseal) and Mason (intra-articular) classifications. Trauma mechanism was categorized as high energy (>1m fall) or low energy (<1m fall). Treatment complications were gathered.
Results: Altogether 138 patients (71 girls, median age 9.8 [IQR 7.6-11.2, range 0.9-11.7]) with 140 fractures (1 open) were included in the study. Median follow-up time was 8.3 weeks (IQR 3.1-39.7, range 0-446). Most fractures (94/140 ,67%) were treated non-operatively; 17 (18%) of these required closed reduction. Of the 39 (28%) primarily internally fixed fractures 20 underwent open reduction. Seven fractures were treated with open reduction and cast immobilization alone. Judet type II fractures were the most frequent (36%), followed by type III (28%), type I (24%), and types IVa (8%) and IVb (4%). Among the 140 fractures, 86 were epiphyseal, with Salter-Harris type II being the most common, accounting for 84 cases. Only two fractures were intra-articular (Mason type 1 and type 2). In 53 patients, concomitant fractures were observed, most commonly involving the proximal ulna (36/53).
High-energy trauma accounted for 74 fractures (53%) and was significantly associated with higher Judet classifications (II-IV) ($p<0.001$), while low-energy trauma was primarily linked to Judet class I fractures.
Thirty-four complications occurred in 29 fractures (21%), (14 growth arrests, 4 malunions, 3 failed reductions, 3 failed

internal fixations, 3 heterotrophic ossifications, 2 avascular necrosis, 2 nerve injuries and 2 malunions). Fractures requiring open reduction were associated with a higher complication rate compared to those requiring closed treatment (37% vs. 18%, $p<0.01$).
Conclusions: Higher trauma energy yields more complex fractures. Complications are common (21%), with growth arrest occurring in 10%. Fractures requiring open reduction are more prone to complications.

A-0525 QUALITY OF LIFE OF SYNDACTYLY PATIENTS

Noora Nietosvaara[1], Niko Kämppä[2,3], Yrjänä Nietosvaara[3,4], Petra Grahn[3]
[1]Department of Orthopedics and Traumatology, Helsinki University Hospital, University of Eastern Finland; [2]Department of Hand Surgery, Helsinki University Hospital and University of Helsinki; [3]Department of Pediatric Orthopedics and Traumatology, New Children's Hospital, Helsinki University Hospital, University of Helsinki; [4]Department of Pediatric Surgery, Kuopio University Hospital, Kuopio, Finland

Introduction: The reported incidence of syndactyly is 2 per 10 000 live births, being one of the most common upper limb deficiencies and syndactyly separation being one of the most common surgical procedures performed for congenital upper limb deficiencies. There is little information about long-term outcomes after surgery in simple, complex and complicated syndactyly.
Aim: This study reports on quality of life in adolescents and adults after syndactyly separation in childhood.
Material & Methods: 156 children had syndactyly separation in our institution between 1963 and 2013, contact information was available for 90 patients who were all invited to attend a clinical follow-up. Seventy patients (45%) agreed to participate in the study at a mean follow-up time of 22.6 years (IQR 12.4-34.6)(Table 1). Mean age of participants at follow-up was 30 years (IQR 14.9-40.4). 43 of the participants had simple (partial 23), 14 complex and 27 complicated syndactyly. Subjective outcome was registered with Quick DASH and EQ-5D-5L questionnaires. Function, cosmesis and pain were assessed with VAS scores. Outcome of simple incomplete, complete and complex syndactyly (n=43) separation was compared with outcome of surgery in complicated syndactyly (=27). The Fisher's exact test was used for categorical variables, Mann-Whitney U test for continuous variables respectively.
Results: Outcomes after surgery in simple and complex syndactyly were similar. The median Quick DASH score in simple and complex syndactyly was 0.0 compared to 6.8 in complicated syndactyly, the respective EQ-5D-5L scores were 1.0 and 0.93 ($p < 0.01$). There was no significant difference in reported cosmetic (VAS= 8.0(5.0-9.0) in simple and VAS=7.0(6.5-8) in complicated syndactyly) or function VAS (VAS=9.0(8.0-9.4) in simple and VAS=7.8(6.5-8.8) in complicated syndactyly) scores. None of the 70 patients reported any pain (current and worst pain VAS=0).
Conclusions: Quality of life appears not to be affected in adolescents and adults that have had surgery for simple, complex and complicated syndactyly in childhood. Patients seem pleased with the cosmetic and functional outcome after syndactyly separation.

A-0526 THE USE OF CROSS FINGER FLAP FOR THE TREATMENT OF AMPUTATION OF THE FINGERTIP

Hideyuki Mizushima
Nagoya Tokushukai General Hospital, Kasugai city, Japan

Introduction: We usually use cross finger flap especially for reconstructing oblique amputations with large volar defects. The aim of this study is to evaluate the outcomes of using cross finger flap for treating fingertip amputation.

Materials and Methods: Materials: We reviewed 26 cases (all men, average age, 50years) of fingertip amputation treated by cross finger flap from July 2009 to November 2022 with at least 3 months observation. The injury sites were as follows: thumb (1), index finger (5), middle finger (12), ring finger (4), and little finger (4). All cases were injured in crush. The average follow-up period was 95weeks (12-395). Fifteen cases are accompanied with distal phalanx bone defect and remained 11 cases are without bone defect. Numbness, pain, sensory defects, and usefulness were examined at the final follow-up. Sensory defects were evaluated by using a 10-point subjective estimation, in which 10 was the highest score. Methods: "U" shaped pedicled flap, raised from the plane between the paratenon of the extensor mechanism and the subcutaneous fat overlying the middle phalanx, was elevated from adjacent finger. And this flap was harvested to injured digit. A full-thickness skin graft from volar side of elbow used to cover the defect on the extensor surface of the donor finger with a tie overResults: All flaps survived with an average score of sensory was 8.3 points (3-10). Slight numbness remained in 7 cases. Pain due to an attack remained in 4 case, which all cases were accompanied with bone defect of distal phalanx. And slight pain remained in 8 cases (5 cases with bone defect, 3 cases without bone defect). Affected finger were useful in all patients nevertheless of slight sensory disturbance.
Summary: Good outcomes were anticipated after reconstruction of the fingertip pulp defects with a cross finger flap.

A-0527 SURGICAL GOWNS IN CARPAL TUNNEL DECOMPRESSION – ARE THEY NECESSARY?

William Watkinson, Emma Reay
South Tees Hospitals NHS Foundation Trust, UK

Reducing the waste created during surgical procedures is key to improving the sustainability of surgery. Operating theatres are a major contributor of waste, and dealing with this by product of surgery is resource heavy and energy intensive.
In 2022 we piloted using plastic aprons for our carpal tunnel decompressions instead of the standard surgical gowns. In order to assess the effect of this change on our patients, we have performed a retrospective observational case-control study comparing infection rates and costs across two groups performing carpal tunnel decompression (CTD) surgery. This study evaluated 120 CTD operations, group 1 n=60 and group 2 n= 60. In group 1 (n=60) the surgeon and scrub nurse performed CTD wearing a simple plastic apron and in Group 2 (n=60) they wore surgical gowns.
Within Group 1 the infection rates were 1.6% (1/60) compared to 0% (0/60) within group 2. There was no statistical difference between the infections rates between these two groups.
A standard disposable apron used in group 1 is reported to weigh 4.9 grams. The Easigown premium surgical gown used in group 2 weighs 160 grams per gown. The cost of the plastic apron is £0.02 per item and the Easigown premium surgical gown is £1.50 per item. The total cost in group 1 is £2.40 vs £180 in group 2, a 7400% increase. The total weight of gowns used in group 1 was 0.58kg vs 19.2kg in group 2, a 3210% increase. According to NHS England, the cost of incineration of "offensive waste" is £298 per tonne.1 The medical incineration costs in group 1 was £0.17 compared to £5.7 in group 2, a 3252% increase.
This pilot study demonstrates there is no significant difference between infection rates when performing CTD with or without a surgical apron. It shows that using simple plastic aprons for CTD is a cost saving procedure which improves surgical sustainability. We hypothesise that simple plastic aprons can be used for local anaesthetic procedures within hand surgery. Providing significant cost saving measures and reduce the environmental impact of surgery, we suggest a large multi centre randomised control trial is required to evaluate our hypothesis.
References: Appendices to the NHS Clinical Waste Strategy (13.11.2024). Available at: https://www.england.nhs.uk/wp-content/uploads/2023/03/B2159ii-appendices-nhs-clinical-waste-strategy.pdf.

A-0528 LONG-TERM OUTCOMES OF VOLAR LOCKING PLATES VS. CAST IMMOBILIZATION IN ELDERLY PATIENTS WITH DISTAL RADIUS FRACTURES: A 3- AND 5- YEAR FOLLOW-UP

Audun Høegh Tangerud[1], Carina Rosales[2], Frede Frihagen[3], Sondre Hassellund[1]
[1]Department of orthopaedic surgery, Oslo University Hospital, Aker, Oslo, Norway; [2]Department of orthopaedic surgery, section for orthopaedic rehabilitation, Oslo University Hospital, Aker, Oslo, Norway; Department of orthopaedic surgery, Østfold hospital trust, Norway

Objective: To compare the outcomes of operative versus non-operative treatment for distal radius fractures (AO/OTA A and C fractures) in patients over 65 years of age, focusing on functional recovery, grip strength, range of motion (ROM), and patient-reported outcomes (PROMs).
Methods: Between 2015 and 2017, 100 patients aged 65 and older with distal radius fractures were randomized between volar plate fixation and non-operative management. This was a non-inferiority trial, with primary outcomes measured using the Quick-DASH score at 1 year. Secondary outcomes included the PRWHE (Patient-Rated Wrist and Hand Evaluation), EQ-5D-5L, EQ-VAS scores, satisfaction, ROM and grip strength.
Results: 40 and 31 patients were examined at 3 years in the operative and non-operative group respectively, and 34 and 28 patients were examined at 5 years. The median Quick-DASH scores were similar between groups at 3 years (median difference -2 (IQR 0 to 0)) and 5 years (median difference 0 (IQR -4 to 0)). At 1 year the operative group had lower PRWHE scores. (median difference -2 (IQR -4, 0)) ($p = 0.019$). This difference diminished by 3 years (median difference -1 (IQR -5, 0)) ($p=0.233$) and 5 years (median difference 0 (IQR 0, +3)) ($p = 0.233$ and $p = 0.857$).Patient satisfaction was higher in the operative group at both 1 year (median difference +2 (IQR 1, 1)) and 3 years (median difference +1 (IQR 0, 2)), with persistent trend at 5 years (median difference 0 (IQR 0, 1)), ($p < 0.001$, $p=0.004$, $p=0,012$). Grip strength was better in the operative group at 1 year (mean difference -12% (95% confidence interval -18 to -5)) ($p < 0.001$), but not at 3 and 5 years (mean difference -7% (95% confidence interval -22 to 8)) and -3% (95% confidence interval -15 to 9)) ($p=0.370$ and $p=0.634$). Range of motion was better in the operative group for volar flexion (mean difference -10° (95% confidence interval -15 to -5)) at three years, and (mean difference -12° (95% CI -17 to -7))at five years, ($p < 0.001$). And supination (mean difference -7° (95% CI -11 to 1)) at five years of the injured hand ($p = 0.003$).
Conclusion: Non-operative treatment remains non-inferior to operative treatment based on Quick-DASH after 3 and 5 years. The small differences between the groups found at one year decreased over time. The differences in range of motion were similar throughout follow-up but the difference were small and likely not clinically relevant.

A-0529 A COMPARISON OF CT, MRI AND ARTHROSCOPY IN EARLY-STAGE CMC-1 OSTEOARTHRITIS

Jens Jørgsholm
Department of Orthopedic Surgery, Hand Surgery Unit, Herlev and Gentofte, Copenhagen University Hospital, Denmark

A-0530 MECHANISM AND PATHOLOGIC FINDINGS IN IRREDUCIBLE DRUJ DISLOCATION

Martin F. Langer, Simon Oeckenpöhler
University Clinic Münster, Germany

Introduction: A locked dislocation of the distal radioulnar joint is a rare injury. In contrast to other non-reducible dislocations, there is no obstacle to repositioning. This mechanism is not described anywhere in the literature.

Aim: Drawings are created based on the cases operated on by the surgeon, which show the dislocation mechanism step by step and are intended to provide an understanding of the pathology.
Material & Methods: In the last 20 years, 7 cases of blocked dislocation of the distal radioulnar joint have been operated on. X-rays, CT images or MRI images were available for all patients. Due to the unclear pathology, dorsal and palmar approaches were chosen to exclude all unclear ruptures or interpositions.
Results: All cases were caused by hypersupination. The two radioulnar ligaments (PRUL and DRUL) were intact. Only thin, irrelevant capsular fibers on the palmar side and individual muscle fibers of the pronator quadratus muscle were torn. The easiest way to achieve the reduction was in a maximum supination position and with the radius and ulna spread apart and with pronation.
The mechanism of the irreducible dislocation is a small tear in the capsule in hypersupination with a simultaneous relaxation of all ligaments with dislocation of the ulna head behind the edge of the radius. This tightens the ligaments again and makes the reduction from the outside impossible
Conclusions: Understanding the pathology helps with targeted, gentle reduction and prevents unnecessary large incisions

A-0531 ROLLING V TO Y PULP ADVANCEMENT AND PARTIAL CRESCENTIC EPONYCHIAL EXCISION FOR SHORT FINGERTIPS WITH DEFORMED CURVED NAILS- A MODIFIED NOVEL TECHNIQUE

W R P De Alwis, I Archchige, D Mallawachchi, Y Abewickrama
Colombo South Teaching Hospital, Colombo, Sri Lanka

Introduction: Partial amputations and surgical shortening of fingertips commonly occur following accidental and occupational injuries which leads to create short fingertips with unsupported, short, deformed curved nails1. Gaining the length and reconstructing esthetically pleasing nails are challenging.
Aim: This study is to share a modified technique to improve the aesthetic outcome that improves the nail show, corrects curved nail deformity, and fill the pulp preserving sensation.
Material & Methods: Twenty-one patients with one or two short fingertips with deformed nails underwent this procedure (15 Females and 6 males). Twenty-six fingers were operated on by the same surgeon. Surgery was done under a ring block with a finger tourniquet as a day-case procedure. Surgical steps are described below and illustrated in the diagram which has Dorsal and volar phases.
Dorsal Phase: partial crescentic mid-eponychial excision is done
Mobilization of distal eponychium, to improve the show of the nail direct closure is done with 5/0 polypropylene
The deformed curved nail plate is removed.
Volar Phase: 5. V shape incision is made placing the apex just proximal to the distal interphalangeal joint crease preserving its blood supply on the volar aspect and the flap is mobilized and advanced in such a way that the distal border of the flap rolls towards the distal margin of the nail bed (dorsally).
6. V to Y advancement flap incision is sutured with 5/0 Polypropylene
7. Finally, an artificial nail is inserted into the nail fold and anchored distally to the newly advanced volar flap and dressing is applied with adequate volar support.
This was a prospective descriptive study. The patients are followed up for 18 months. Lengthening of the fingertip (distance from the distal interphalangeal joint crease to the distal-most end of the finger), amount of nail show (eponychial fold to distal-most end of the finger compared with pre-operative show as a percentage), nail deformity and pulp sensation, and nail adherence to the nailbed were assessed prospectively.

Results: The average lengthening of the tip is 3.35mm. The increase in the longitudinal nail plate show was 18%. The preserved sensation of the pulp was observed in all the cases, Grooved nail deformity was observed in 2 fingers in two different patients. Non-adherence of the distal nail to the newly advanced tissue was observed in all cases which did not affect overall appearance. Patient overall satisfaction was 92% assessed with a questionnaire. The average operating time per finger is 35 minutes. Flap necrosis, surgical site infection, and scar complications not observed
Conclusions: There are a number of techniques to reconstruct fingertips2,3 Creating a sensate pulp with aesthetically pleasing nails is a challenge when the part of the nail is intact and deformed. This technique is a day-case procedure that has high patient satisfaction and good aesthetic outcomes. Short operating time, local anesthesia, and fewer complications make this technique cost-effective. The study has now expanded to combine nail bed grafts onto the newly advanced flap to improve the adherence of the distal nail to the new nail bed.

A-0532 A SURVEY AMONGST SOUTH AFRICAN HAND SURGEONS TO DETERMINE THE COMPARATIVE TREATMENTS OF TRIGGER FINGERS VERSUS DE QUERVAIN'S TENOSYNOVITIS

Pieter Jordaan
Garden Route hand Unit, George, South Africa

Introduction: Trigger Fingers and De Quervain's are often regarded as similar conditions with similar treatment, but the pathology is not similar and the response to treatment does differ.
Aim: To assess whether South African surgeons, treat De Quervain's and trigger fingers in a similar fashion. The hypothesis is that despite being seen as similar conditions, they respond differently, and the survey is to see if this is borne out in how surgeons manage both conditions. This will be compared to current literature.
Material & Methods: The survey was performed by handing out a questionnaire at a meeting of local hand surgeons.
Results: A total of 49 surgeons responded. Thirty of these treat De Quervain's and trigger fingers the same. Of these 4 surgeons perform surgery as their primary treatment modality, whereas the rest start with injections. A further 10 surgeons use cortisone injections as primary treatment, but 7 of these will give patients with De Quervain's more injections, whereas 3 will give more injections to patients with trigger fingers. Two surgeons prefer surgery for De Quervain's, but injections for trigger fingers, and 6 surgeons prefer surgery for trigger fingers, but injections for De Quervain's.
Conclusions: According to this survey, 73% of surgeons treat trigger fingers and De Quervain's primarily with cortisone injections, which is in line with current literature. Of this group, 72% treat them with a similar number of injections. In total 61% of surgeons treat the two conditions in a similar fashion.

A-0533 CLINICAL OUTCOMES OVER TWO YEARS AFTER DENERVATION FOR LATERAL EPICONDYLITIS OF THE ELBOW

Naomi Hanaka, Hiroshi Satake, Ryusuke Honma, Yasushi Naganuma, Junichiro Shibuya, Toshiya Nito, Masahiro Tsuchiya, Michiaki Takagi
Department of Orthopaedic Surgery, Yamagata University Faculty of Medicine, Yamagata., Japan

Introduction: We have operated on lateral epicondylitis of the elbow by denervation of the posterior branch of the posterior antebrachial cutaneous nerve since 2013.
Aim: We report the clinical outcomes over two years after denervation.
Material & Methods: From April 2013 to September 2022, 42 limbs with lateral epicondylitis were operated on. A block test with a local anesthetic was performed preoperatively in the subcutaneous fat layer four cm proximal to the lateral

epicondyle of the elbow to determine the surgical approach, and denervation was selected for those cases that responded significantly and another technique for those that did not improve. Denervation was performed on 20 limbs. Excluding three reoperations and one case of inadequate block test effect, denervation was selected as the initial surgery in 16 limbs (38%). In these cases, 12 limbs could be observed over two years. Therefore, we evaluated these cases in the present study. Age, gender, observation period, pre-and postoperative pain, satisfaction, and complications were examined. Pain was assessed with a 100 mm visual analog scale (VAS).

Results: The patients included in this study were six females and six males, with a mean age of 63 years (range 48 to 72) years. The mean observation period was 47 months (range 24 to 72) months. The mean VAS significantly improved from 69 mm (range 31 to 90) mm preoperatively to 6 mm (range 0 to 28) mm postoperatively ($p < 0.05$, Mann-Whitney U test). Satisfaction was excellent (complete remission) in 8 (67%), good (mostly improved) in 3 (25%), fair (mostly remaining) in 0, and poor (no improvement or recurrence) in 1 (8%). Complications included forearm paresthesia in 8 limbs (67%), which resolved in 7 limbs within an average of 10 (range 5 to 12) months and remained mildly residual in 1 limb.

Conclusions: Denervation was indicated in 48% of patients with lateral epicondylitis who required surgery, and 92% improved. Although denervation carries a high risk of producing sensory deficits, it appeared to be the procedure of choice in cases where the block test was effective.

A-0534 RESULTS OF DUO-MOBILE PROSTHESIS IN TRAPEZIOMETACARPAL JOINT OSTEOARTHRITIS WITH A MEAN FOLLOW-UP OF 2 YEARS

Pia-Elena Frey[1], Astrid Schenker[1], Simeon Däschler[2], Maximilian Franzen[1], Benjamin Panzram[1]

[1]Department of Orthopedics, University Hospital Heidelberg, Germany; [2]Department of Hand, Plastic and Reconstructive Surgery, Burn Care Centre, BG Trauma Centre Ludwigshafen, Germany

Introduction: Implantation of a dual-mobility TMC joint prosthesis has been shown to be an effective treatment for advanced osteoarthritis, with excellent short-term clinical results and significantly lower rates of dislocation and loosening.

Aim: This study aims to present the clinical and functional results of the TOUCH® prosthesis with an average follow-up of 2 years.

Material & Methods: This prospective, single-center study included 78 patients with 88 prostheses, operated by a single surgeon between 08/2019 and 12/2023. Data collection included complications, radiographic measurements (thumb length, hyperextension > 15°, signs of loosening), range of motion (ROM, Kapandji), grip/pinch strength, pain level (NRS 1-10), and functional scores (qDASH and MHQ).

Results: The mean follow-up was 24 months, ranging from 6 to 61 months. A total of 55 women and 23 men underwent the procedure, with a mean age of 59 years at the time of surgery (range 42-77 years). Four patients required revision for impingement between cup and neck (2x) and cup dislocation after primary cup misplacement (2x). An additional seven reoperations were performed for wound healing disorders or secondary de Quervain's disease. No other complications such as infection, loosening or dislocation were noted. At a mean follow-up of 2 years, the Kaplan-Meier survival rate with revision surgery as the endpoint was 96%.

Functional scores showed a significant improvement in hand function at 24 months after surgery, with the mean qDASH score improving from 51 to 29.6 ($p < 0.01$) and the mean brief MHQ increasing from 43.5 to 71.8 ($p < 0.01$). Pain levels were significantly reduced with NRS scores decreasing from 7.5 to 2.4 ($p < 0.01$). Kapandji improved from 8.7 to 9.6 ($p < 0.01$). Postoperatively, the mean length of the first metacarpal (M1) increased significantly from 58 mm to 68 mm ($p < 0.01$) correlating with improved hand spans (19.4 to 20.4 cm, p = ns). Preoperative hyperextension >15° was observed in

23 thumbs (mean 22°, range 15° to 38°), which was corrected to a mean of 6° postoperatively (range 0 to 20°, $p < 0.01$). Grip (16.1 to 16.0 kg) and pinch strength (4.6 to 5.3 kg) remained comparable ($p = ns$).
Conclusions: Short- to mid-term results with an average follow-up of two years after TOUCH® prosthesis implantation for TMC joint arthritis indicate significant improvements in hand function and pain relief. In addition, there is a significant correction in thumb length and a reduction of hyperextension of the metacarpophalangeal joint of the thumb. Complication and revision rates are low which makes TMC joint arthroplasty a reliable and safe treatment option.

A-0535 CONSERVATIVE TREATMENT FOR PEDIATRIC LUNATOMALACIA (KIENBÖCK DISEASE)

Soya Nagao[1,3], Yasuhiro Toyoizumi[2], Yoshiaki Tomizuka[3], Koji Tanimoto[3], Kana Kataoka[3], Hiroko Shiraishi[3], Tomonori Kinoshita[3], Kazuyoshi Nakanishi[3]
[1]Itabashi Medical Association Hospital, Tokyo, Japan; [2]HigashiKoganei Sakura Clinic, Tokyo, Japan; [3]Nihon University School of Medicine, Tokyo, Japan

Introduction: Lunatomalacia is rare, especially in children and adolescents. We report two cases of pediatric lunatomalacia who were treated conservatively.
Case 1: A 9-year-old boy presented with right wrist pain of 4 months' duration. Physical examination revealed localized tenderness and decreased range of motion (ROM) of the affected wrist. X-ray and CT showed sclerosis of the lunate and ulnar negative variance, and MRI showed hypointense signal density on T1-weighted image. Immobilization with a wrist brace had applied for 4 months. One year later, He regained ROM equal to the contralateral side without pain. X-ray showed restoration of bone density, and MRI showed normal intensity.
Case 2: A 14-year-old male complained of left wrist pain for the previous 2 months. There was tenderness over the lunate and restriction of ROM.X-ray and CT showed sclerotic changes at the lunate and negative ulnar variance. MRI T1-weighted image showed a homogeneous decrease in signal intensity at the lunate. The affected wrist was had protected with a wrist brace for 6 months. One year later, his pain had resolved with improvement of ROM. X-rays, CT and MRI showed normal.
Conclusions: Skeletally immature patients have great potential for revascularization and remodeling of the lunate. Pediatric lunatomalacia is expected to heal without any surgical intervention if it is in an advanced stage.

A-0536 LINBURG COMSTOCK ANOMALY AND THE DEVELOPMENT OF DYNAMIC TRIPOD PENCIL GRASP IN EARLY FOUNDATION PHASE LEARNERS

Pieter Jordaan, PC Pelser, Larissa Hall, Bridget Hartley, Elize Janse van rensburg
Garden Route Hand Unit, George, South Africa

Introduction: Linburg-Comstock Anomaly is a condition with an abnormal connection between the index finger FDP tendon and FPL, preventing independent flexion of the thumb and index finger. It has a prevalence of 31-37% and is more common unilateral than bilateral
Aim: Achieving a dynamic tripod pencil grasp (DTPG) is one of the mayor focusses in young learners. We hypothesize that Linburg Comstock anomaly (LCA) can adversely affect the development of a DTPG. If this can be proven, unnecessary intervention and therapy for affected children can be prevented.
Material & Methods: An observational, cross-sectional study of early foundation phase learners was conducted to evaluate children for LCA and to assess their pencil grasps.

Results: 218 children were assessed with 50 children (23%) testing positive for LCA. Of these, 22 children (44%) did not have a DTPG, while 15 (30%) did achieve a DTPG. Of the 168 children without LCA, only 81 (48%) had a DTPG and 87 (52%) did not

Conclusions: While the prevalence of LCA in the study population was within reported limits, the presence of a DTPG was lower than expected. The presence of LCA did not seem to influence the development of a DTPG. Various confounding factors as well as future research will be discussed.

A-0537 MINIMAL INVASIVE APPROACH IN THE TREATMENT OF EARLY-STAGE DUPUYTREN'S CONTRACTURE: PERCUTANEOUS NEEDLE APONEUROTOMY AND FAT INJECTION

Percin Karakol, Onur Zengin, Muhammet Acar, Eren Tuncer, Yasin Canbaz

Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, İstanbul Türkiye

Introduction: Dupuytren's disease is a fibroproliferative disease of the superficial palmar fascia of unknown etiology that causes progressive flexion deformities of the fingers. The first symptom of the disease is pitting and thickening of the palmar skin. Diagnosis is made by the presence of a painless and firm nodule localized to the skin or fascia. Over time, the nodules begin to contract by transforming into cord structures and cause progressive flexion contractures in the MCP and PIP joints. Treatment options vary from conservative methods to surgical interventions depending on the degree of the disease. Early-stage percutaneous needle aponeurotomy and fat injection stands out as a minimally invasive, reliable and effective treatment.

Aim: To evaluate the effect of fat grafting on the risk of recurrence in Dupuytren's Contracture by reducing myofibroblast density and replacing missing subdermal fat tissue.

Material & Methods: 16 patients (12 males, 4 females), aged between 42 and 65, who were treated with percutaneous aponeurotomy and fat injection between January 2023 and November 2024, were admitted to our clinic. Two patients had bilateral hand involvement. All operations were performed under general anesthesia. 20 ml of 2% lidocaine and 1 ml of 1:1000 epinephrine per liter of physiological saline were used as tumescent solution. Fat grafts were taken from the abdominal region in 11 patients and from the inner thigh due to fat insufficiency in 2 patients with a 4 mm liposuction cannula. Approximately 20 cc of fat graft was obtained after filtration. The pathological cords were released during percutaneous aponeurotomy with a 26G needle. Then, approximately 10 cc of fat graft was injected into the affected hand and the procedure was completed. The patients were immobilized with an extension splint for 2 weeks postoperatively and were included in a 1-month physical therapy program.

Results: A significant improvement was recorded in the contracture degrees in the measurements taken at the 1st and 3rd months postoperatively. Preoperative MCP joint contractures were measured as 19.76°±5.68° on average and PIP contractures were measured as 19.30°±5.94°. These values decreased to 4.30°±1.93° and 6.30°±2.13°, respectively, at 3 months after surgery ($P < 0.001$). No major complications, hypoesthesia, or neurovascular damage such as hematoma were observed in any patient. While the range of motion in the MCP joints almost returned to normal, it was observed that some contractures persisted in the PIP joints due to pathological changes in the pericapsular structures.

Conclusions: There is no treatment that completely cures Dupuytren's disease or stops its progression. While methods such as extension splint and physical therapy aim to prevent contracture formation in the early stages, open or closed surgical treatments are preferred in advanced cases. Open surgery is generally recommended for MCP contractures >30° and/or PIP contractures of all degrees. Closed methods include techniques such as steroid or collagenase injection and needle aponeurotomy. PALF has been found to be safe and effective in the early stages as a minimally invasive treatment. Longer-term results require at least 1 year of follow-up and large-scale randomized trials.

A-0538 HAND APPEARANCE IN HAND DISORDERS: THE THIN LINE BETWEEN AESTHETICS AND FUNCTION

Lorenzo Garagnani[1,2,3]
[1]Guy's and St Thomas' NHS Foundation Trust, London, UK; [2]King's College London, UK; [3]SE1 Medical Aesthetics, London, UK

Introduction: The focus of hand surgery is traditionally on functional improvement or restoration. However, most hand disorders also affect the appearance of the hand and this has repercussions on hand use, function and patient quality of life. This is due to the fact that the human hand is an important tool for social interaction. The role of hand aesthetic improvement has traditionally been overlooked in paediatric and adult hand surgery alike, although hand appearance is assessed in patient-reported outcome measures. Improved hand appearance has a positive effect on patient confidence and hand function.
Aim: To understand the relevance of hand aesthetics for hand function, the aesthetic benefits of surgical treatment of hand disorders and the treatment options for hand disorders affecting the appearance of the hand.
Material & Methods: A series of hand disorders that also affect hand appearance has been assessed. The aesthetic improvement achieved with hand disorders treatment and its positive effect on hand function are discussed. The current treatment options for hand appearance improvement are also described.
Results: Hand function and aesthetics have been demonstrated to be strongly correlated. Both surgical treatment of hand disorders leading to concomitant aesthetic improvement and non-surgical aesthetic treatment for hand disorders altering the appearance of the hand play a role in patient's improved confidence and use of the hand.
Conclusions: The hands are the most exposed part of the human body, as they are a tool for social interaction and are constantly visible not only to the other individuals, but also to their owner. Hand surgery studies with patient reported outcome measures include hand appearance among the assessed parameters. An improved hand appearance leads to improved patient confidence and an improved use of the hand.

A-0539 LATE NERVE TRANSFERS IN TETRAPLEGIA

Carina Reinholdt, MD PhD, Hannes Granberg, MD, Johan Bergz, MD
Center of advanced reconstruction of extremities/ dept of Handsurgery/ Sahlgrenska/ Mölndal/ Sweden

Introduction: Sustaining a cervical spinal cord injury is devastating for hand and arm function. Many patients undergo long rehabilitation. Nerve transfers may improve or give back function. For patients with upper motor neuron injuries the reflexes stay intact and thus making the possibility to do nerve transfers possible.
Aim: to acchieve active finger and thumb extension in patients with tetraplegia
Material & Methods: preoperative testing of excisting motor end plates with electrical response of finger and thumb extensor muscles. The surgical procedure of SPIN (supinator motor branches to posterior nerve transfer) was performed and the muscle strength according to MRC was measured, preliminary results on 7 patients.
Results: The nerves grew out to give the patients finger and thumb extension, which can enhance a grip reconstruction.
Conclusions: nerve transfers may be used to improve and create active muscle function in tetraplegia even up to 12 years after the injury

A-0540 ULTRASOUND-ASSISTED DIAGNOSIS AND THE UTILITY OF MICROSCOPIC LATERAL SUBPERIOSTEAL APPROACH FOR SUBUNGUAL SOFT TISSUE TUMORS

Yusuke Kido, Takashi Shimoe, Akimasa Murata, Yuki Matsuyama, Hiroshi Yamada
Wakayama Medical University, Wakayama, Japan

Introduction: Subungual soft tissue tumors, though rare, often cause significant pain and functional impairment. Accurate diagnosis and effective treatment are critical to resolving symptoms while minimizing complications. Ultrasonography has emerged as a valuable diagnostic tool, offering real-time visualization of these lesions. The microscopic lateral subperiosteal approach represents a minimally invasive surgical technique that preserves nail aesthetics and reduces the risk of complications. This study evaluates the efficacy of these techniques in the diagnosis and treatment of subungual soft tissue tumors.
Aim: To assess the diagnostic utility of ultrasonography and the clinical outcomes of the microscopic lateral subperiosteal approach in the management of subungual soft tissue tumors.
Material & Methods: Seven patients (2 males, 5 females; aged 38–75 years, median age 50) presenting with symptoms indicative of subungual tumors were included. All patients underwent ultrasonography and MRI for preoperative evaluation. Surgical excision was performed using a microscopic lateral subperiosteal approach under magnification to ensure precise tumor removal. Tumor characteristics, histopathological findings, and postoperative outcomes, including pain relief, nail deformities, and recurrence, were analyzed during a follow-up period ranging from 1 to 5 years (median 2 years).
Results: Ultrasonography identified hypoechoic lesions in 6 out of 7 cases, with vascularity detected using power Doppler mode. MRI findings correlated with ultrasound results in these cases. Tumor sizes ranged from 0.8 to 6.5 mm (mean 3.4 mm). Histopathological diagnoses included 6 glomus tumors and 1 angioleiomyoma. Postoperatively, all patients experienced complete resolution of pain and tenderness. No recurrences or new nail deformities were observed. Of the two patients with preoperative nail deformities, one showed complete resolution, and one had residual deformity without functional impairment.
Conclusions: Ultrasonography is an effective, non-invasive diagnostic tool for subungual soft tissue tumors, providing precise tumor localization and aiding surgical planning. The microscopic lateral subperiosteal approach ensures complete tumor excision with minimal postoperative complications, preserving nail aesthetics and functionality. These combined techniques offer a highly effective strategy for managing subungual soft tissue tumors.

A-0541 TREATMENT OF EXTENSOR TENDON INJURIES WITH EARLY ACTIVE MOTION PROTOCOL WITH A RELATIVE MOTION SPLINT - A PROSPECTIVE CASE SERIES

Simone Bode, Stefan Benedikt, Tim-Joel Bernd Deschner Gernot Schmidle, Rohit Arora
University Clinic Innsbruck, Austria

Introduction: Due to their exposed position, extensor tendon injuries often occur as collateral damage with injuries of the hand. In order to regain full functionality of the hand, sufficient diagnostics and high standard treatment are mandatory. Surgical treatment and the post-operative follow-up protocol should enable early but also save movement to prevent adhesion of tissue and avoid secondary tendon re-rupture. As the anatomical structure of the extensor tendon is changing along its course, optimal suture technique should observe the anatomical zones defined by Verdan. Providing stability while also reducing the gliding resistance to a minimum are key requirements for the suture. Furthermore, intraoperative testing of the suture stability enabled by the WALANT Method allows an early active motion follow up and prevents the risk of re-rupture.

Aim: The aim of the study was to examine the objective and subjective results of an early active motion protocol with a relative motion splint following extensor tendon injury repair.
Material & Methods: In this prospective case series, patients with digital extensor tendon injuries were examined. Observing the different zones (Verdan) in which the injury occured a suitable suture was chosen and the early active motion protocol was initiated. Follow-up visits were scheduled in cooperation with the department of physical medicine and rehabilitation 2, 4, 6, and 12 weeks and 6 months after surgery to monitor motion progress. Pinch Grip, grip strength, passive range of motion, active range of motion and the distance between fingertip and palm (FKHA) were measured. Subjective data like overall satisfaction, pain sensation and impairment in daily life were also captured.
Results: This study included 20 patients. All patients underwent extensor tendon repair using the WALANT technique, followed by the early active motion protocol. No re-ruptures occurred. Range of motion was satisfactory at last follow-up time point compared to the healthy uninjured hand. Good results in patient satisfaction was achieved regarding the splint, the subjective function and the WALANT method
Conclusions: Extensor tendon repair in WALANT with an early active motion protocol and a relative motion splint follow up is a safe and effective surgical approach to digital extensor tendon injury.

A-0542 MANAGEMENT OF NEUROMAS-IN-CONTINUITY IN UPPER LIMB WITH THE FLY-OVER NERVE GRAFTING TECHNIQUE

Eleni Karagergou[1], Emmanouil Pantelidis[1], Dimitrios Kitridis[2], Paschalia Athanasiadou[1], Panagiotis Givissis[1]
[1]AUTH Hand Unit, 1st Orthopaedic Department, Aristotle University of Thessaloniki, G. Papanikolaou Hospital, Greece; [2]1st Orthopaedic Department, 424 Army General Training Hospital, Thessaloniki, Greece

Introduction: Neuromas-in-continuity result from partially injured or repaired nerves and may present with significant therapeutic challenges, especially when function is partially preserved and/or when they are tethered to adjacent vital structures. Neuroma excision after intraneural dissection without jeopardizing the intact nerve fascicles may not always be possible and some form of nerve grafting is often required to restore the nerve continuity.
Aim: The aim of this study is to present a "fly-over" nerve grafting technique for the restoration of peripheral nerve continuity and function in cases of post-traumatic and possibly scar-tethered neuromas-in-continuity.
Material & Methods: We report the cases of two patients with neurotmesis of at least one of the major upper limb nerves. The first was a 69yo male with delayed presentation of median and ulnar nerve neurotmesis in his right arm where a median nerve neuroma in continuity was developed, scar-tethered onto the previously injured and subsequently repaired brachial artery. In the second case a 43yo male presented with a low ulnar nerve palsy following a repaired spaghetti injury of his left distal forearm 7 months ago. In the first case nerve conduction studies (NCS) indicated high ulnar and median nerve palsy and a positive Tinel sign was found over the scar while for the second patient a low ulnar nerve palsy with restored sensation across the ulnar nerve distribution were present. In the first case, for the surgical restoration of the continuity of the median nerve, the scarred segment was left in situ to avoid reinjuring the brachial artery and a "fly-over" nerve grafting technique with sural nerve autografts was employed, while the continuity of the ulnar nerve was also restored with sural nerve autografts. For the second patient, the same "fly-over" technique was utilized only for the motor component of the ulnar nerve, while the recovering sensory fascicles with the neuroma in continuity were left in place.
Results: While both patients are still in the follow-up period, both clinical and NCS findings are indicative of the gradual sensory and motor nerve recovery taking place.
Conclusions: The fly-over nerve grafting is a useful technique for bypassing neuromas-in-continuity, especially in cases

with partially intact nerve fascicles or scar-tethered neuromas to major vessels and other important structures. It provides a practical solution on such occasions and aims in overcoming the unique intraoperative challenges that may arise during neuroma surgery.

A-0544 THE "ELONGATION RAIL" TECHNIQUE FOR RECONSTRUCTION OF TENDON DEFECTS

Eleni Karagergou, Dimitrios Rigkos, Byron Chalidis, Panagiotis Givissis
AUTH Hand Unit, 1st Orthopaedic Department, Aristotle University of Thessaloniki, G. Papanikolaou Hospital, Greece

Introduction: Tendon defect reconstruction is a challenging procedure that can be complicated by tendon retraction, expansion of the tendon gap after thorough debridement of the frayed tendon ends and interposed scar tissue formation. Although application of tendon autografts from dispensable tendons are considered the gold standard of bridging the gap, donor-site morbidity cannot be ignored.
Aim: We present a novel technique for reconstruction of tendon defects that could be effectively applied in most of the tendon zones, avoiding graft harvesting and donor site morbidity.
Material & Methods: A reverse L-type longitudinal incision of the same length with the measured final gap is applied at the middle of the better suited (proximal or distal) tendon stump and the created intercalary tendon segment is used to bridge the tendon gap. The tendon graft is subsequently stabilized to both proximal and distal stumps via a 4 strand core suture and running epitendinous suture technique (the "Elongation Rail" technique).
Results: So far, the described technique has been applied successfully in four patients with flexor tendon defects with excellent results and functional outcome according to Strickland and Glogovac criteria.
Conclusions: The "Elongation Rail" technique presents an alternative option for tendon defect reconstruction. It could be applied in almost all hand zones and subsequently restores the flexor or extensor tendon defect and function, regardless the extent of tendon gap.

A-0545 "THE BIRMINGHAM BOTTLE TEST" – A SHORT CUT PRACTICAL METHOD OF ASSESSING LEVEL OF FUNCTION OF THE SPASTIC UPPER LIMB IN THE HEMIPLEGIC PATIENT

Petros Mikalef, Paul Malone, Mike Craigen
Birmingham Hand Centre, The Royal Orthopaedic Hospital, Birmingham, UK

Introduction: Assessing the hemiplegic patient poses significant challenges. Some patients are referred for operative treatment to improve the affected arm, but a few of them are not sure as to what to expect, or can present with unrealistic expectations. In the initial assessment the baseline function needs to be carefully assessed to make sure that the anticipated result is clearly drawn. The existing methods are the Fugl Meyer score, the House classification, some of which are not very easily applied when a patient is cognitively impaired, or need a specialist healthcare professional to take place. In our unit, we don't have a specialist neurophysiotherapist.
Aim: To present the short cut practical method of assessing level of function of the spastic upper limb in the hemiplegic patient currently used in the multi-consultant clinical assessment at the Royal Orthopaedic Hospital
Material & Methods: Once the patient's history is taken, the patient is asked what is the current use of the affected arm. Following that the patient is asked to demonstrate how they open a bottle of beverage – water, or coke etc
The affected arm is anticipated to be the assisting arm in this function and the bottle needs to be stabilised in an upright

position so that the non-affected arm is able to unscrew/loosen the lid
Observations as follows:
1. The patient is able to hold the bottle and consequently loosen the lid using the non affected hand
2. The patient is able to hold the bottle but not in an upright position
3. The patient stabilises the bottle between the forearm and the trunk of the body to loosen the lid
4. The patient positions the bottle between the legs to stabilise and loosen the lid

Meaning:
1. The patient can control the arm to stabilise the hand in the desired position – the shoulder, elbow, forearm, wrist and hand muscles are able to coordinate
2. The patient can control the arm to stabilise, but not in the desired position – usually the pronator or the flexor carpi ulnaris doesn't allow the forearm to get to neutral
3. The patient has good control of elbow and shoulder – no useful use of the hand in stabilization
4. The patient can't use/neglects the affected upper limb

When the patient performs the task observations can take place regarding the ability open the affected hand and grab the bottle independently or if they need the non affected to position the bottle in the affected handConclusions: The result of the examination helps understand the level of functionality that is present in the patient's arm.

A-0546 COMBINED NERVE AND GRIP RECONSTRUCTION IN TETRAPLEGIA

Carina Reinholdt, Johan Berg, Lina Käll Bunketorp, Anders Björkman
Carina Reinholdt, MD PhD, Johan Berg, MD, Lina Käll Bunketorp PT, Professor, Anders Björkman MD, Professor

Introduction: Patients with tetraplegia often need a grip reconstruction. S-PIN procedures (supinator to posterior interosseus nerve) provides the patient with active finger- and thumbextension as well as adding another wristextensor when healing well. combining this with tendon transfers provides the patients with a good opening of the hand and a strong grip and pinch which are reliable. in two studies we have followed our patients who underwent combined grip reconstruction.
Aim: Prove a better way of restoration of the grip and release function in tetraplegia
Material & Methods: The patients underwent grip reconstruction with combined nerve and tendon transfers, and were divided into a study group and compared with a historical cohort undergoing grip reconstruction. In the first study the patients were recruted consecutively, and in the other study the patiens were matched. COPM, pinch strength and grip strength were followed.
Results: In both studies there were advantages for the patients undergoing the combined grip reconstruction, compared to the historical with only tendon transfers. The hisorical group was however stronger.

A-0548 OUR 5 YEARS EXPERIENCE OF WRIST ARTHROSCOPY FOR SCAPHOID NON-UNION TREATMENT

Daniel Vilcioiu, Claudiu Jaba
Hans Surgery Clinic, Bucharest, Romania

Introduction: Wrist arthroscopy is now the most popular technique for minimally invasive treatment of wrist pathology. From ligaments to bones, from complex sutures to osteotomies, bone grafting and stiffness debridement, arthroscopic

view is by far the most accurate tool for diagnosis and treatment of articular problems.
Aim: To demonstrate that healing is faster in minimally invasive surgery, arthroscopic view is the most accurate in articular pathology, wrist arhtroscopy and WALANT` is the future in the field
Material & Methods: Scaphoid non-unions can be treated by multiple operative techniques including free flaps, local flaps and prosthesis. The most minimal invasive technique is the artrhoscopic technique with non vascularized bone graft. Even if is a difficult in the beginnings with a long duration time, still a tourniquet time, we managed to shortened it and to control every step of the technique in a well trained team: percutaneous reduction of the DISI deformity, mini-open bone graft harvesting from distal radius and iliac crest, screw fixation and fluoroscopic confirmation. We were obligated to add mini-ops approaches: volar for humpback reduction and dorsal for the screw fixation.
In the last 5 years we operated a number of 32 patients with scaphoid non-union, 14 of the cases were perfomed all artrhoscopic, and 18 arthroscopic assisted – mini-open approaches. 16 of the cases were operated only by WALANT local anesthesia with multiple advantages. We choosed only stable screw fixation in order to start the hand therapy program by 6 weeks.
Results: All the patients were measured in the hand therapy department- strength, ROM , pain , and specific questionnaires- in order to re-evaluate after 3, 6, 12 and 24 months.
We achieved strong bone union in all the cases and good too very good results after the hand therapy program.
Conclusions: The future is always minimaly invasive and we adopted this protocol for most of our scaphoid fractures and non-unions with very promising results even if sometimes is a prolonged operating time and use of multiple resources.

A-0549 OPTIMIZING PLANNING FOR SHOULDER JOINT ARTHRODESIS- WITH 3D PRINTED BONE MODELS

Magnus Flondell[1], Hanna Frost[1], Per Nordmark[2], Dag Welin[2], Per Wahlström[2], Muris Imsirovic[3], Einar Heiberg[3]
[1]Department of Hand Surgery, Skåne University Hospital, Malmö, Sweden, Department of Translational Medicine - Hand Surgery, Lund University, Malmö, Sweden; [2]Department of Integrative Medical Biology, Physiology Section, and Department of Surgical and Perioperative Sciences, Section for Hand and Plastic Surgery, Umeå University, Umeå, Sweden; [3]Department of Clinical Physiology, Department of Clinical Sciences Lund, Lund University, Skåne University Hospital, Lund, Sweden, Wallenberg Centre for Molecular Medicine, Lund University, Lund, Sweden

Introduction: Shoulder arthrodesis is a rare intervention, since the introduction of shoulder arthroplasty. In this method report arthrodesis was performed to relieve pain and increase hand function. To decrease intraoperative time, a malleable reconstruction plate can be used.
Aim: To save time during surgery and increase precision we propose the usage of a 3D printed anatomical model to prebend the plate.
Material & Methods: To make a 3D planned shoulder joint arthrodesis, a high-resolution CT scan of the patient's humerus and shoulder joint was performed. The overall process is then that the patient's CT scan is segmented, and a 3D model of the joint is printed.This enables meticulous pre-operative bending of the plate, a time-consuming procedure which can now be conducted prior to the operation. The plate is sterilized and used for reposition and arthrodesis of the Glenohumeral joint.
Results: The patient had suffered an upper extremity dysfunction caused by nerve trunk damage to the arm. Consequently, surgical intervention involving joint fusion of the shoulder joint was planned to improve function and pain management.
Conclusions: The use of the 3D-printing technique can enhance the accuracy of positioning the shoulder joint and in the reduction of postoperative complications. The technique has the potential to be used in a similar fashion in other scenarios.

A-0550 PISIFORM VASCULARIZED BONE GRAFT FOR SCAPHOID NONUNION

Davide Smarrelli
Humanitas Bergamo, Italy

Background: Vascularized bone grafts are more effective at promoting and facilitating bone healing and revascularization of the bone than non-vascularized bone grafts, especially with proximal avascular necrosis, though do not always succeed. The pisiform consists of cancellous and cortical bone and provides an ample articular surface. The pisiform vascularized flap is an option for treating Kienbock's disease and defects of the radial articular surface; we proposed as a surgical treatment for scaphoid nonunion, in proximal pole and middle scaphoid.
Materials & Methods: In this study we report our experiences of 5 patients with a follow up on between 3 and 5 years. Three patients had previous failed surgery, two had primary avascular proximal pole necrosis; k-wires were used in 4 patients, cannulated screw in one patient. After surgery the wrist was immobilized with a spica thumb brace for 8 weeks; x-rays were performed routinely after 8 and 12 weeks and moreover when required furtherly every 5 weeks.
Mean average healing time was 3 months with a maximum of 8 months in one pts.
We observed only one mild ulnar drifting, anymore mobilizations of pisiform positioning occurred
Results: Clinical outcome was assessed by patient's satisfaction rate, VAS preop and post op, Green and O'Brien score, ROM evaluation, strength evaluation with JAMAR.
In order to patient's satisfaction rate, four patients were completely satisfied, one slightly satisfied.
VAS moved from a mean of 7.6 in preoperative to a mean of 2.2 in the post operative especially during prolonged activity.
Green -O'Brien score was excellent in 2 patients, good in 2 patients and fair in 1 patient.
ROM assessment after surgery showed that 60% to 90% of wrist motion was recovered compared to the normal side, with improvement on the affected wrist after surgery for a range of 25 to 45 degrees.
Meanwhile 70% to 100% of strength was recovered with 25,6 kg obtained in the operate wrist compared to 27,8 kg in the healthy wrist.
Removal of K was necessary in 2 patientsConclusions: We report good results in order of functional recovery and bone healing. All patients returned back to their working activities.
This graft represents a reliable sort of treatment for severe AVN and/or previous failed surgery, among other strategies as well as arthroplasties, femoral bone graft.

A-0551 ARTHROSCOPIC RECONSTRUCTION WITH DISTAL RADIUS BONE GRAFT FOR INSTABLE SCAPHOID NON-UNIONS IN CHILDREN AND ADOLESCENTS

Lorenzo Foschi, Sandra Pfanner, Andrea Poggetti
Hand Surgery and Reconstructive Microsurgery Unit AOU-Careggi, Florence, Italy

Introduction: Scaphoid fractures account for less than 3% of fractures of the hand and wrist in pediatric patients, with non-unions being rare. The authors present a series of 8 cases of instable non-unions in skeletally immature patients.
Aim: Assessing whether arthroscopic treatment with a distal radius graft may be the treatment of choice in skeletally immature patients.
Material & Methods: From 2021 to 2023, 8 pediatric patients (7 males and 1 female) with scaphoid non-union were operated on at our center. The mean age was 14.2 years (range 12-16). The average follow-up was 16.8 months (range 12-36 months). In 2 cases, initial treatment was conservative, while in 6 cases, the fracture was not diagnosed. Diagnosis

of non-union and definitive treatment were performed on average 4.2 months (range 3-6 months) after the initial trauma. All patients underwent preoperative CT scans, and non-unions were classified according to Schmidle (2WW, 4WR, 2RR). Surgical treatment followed the recommendations of the Caloia and Fernandez classification. Six patients underwent arthroscopic osteosynthesis, and 2 underwent arthroscopically-assisted osteosynthesis, using headless screws or Kirschner wires. In 7 cases, autologous bone grafts were harvested from the distal radius.
Functional evaluation was performed using the DASH questionnaire, and healing was assessed with CT scans.
Results: Consolidation was achieved in all cases, with a mean time of 8.5 weeks (range 8-12), without complications or reoperations. The average postoperative pain score at the last follow-up was 2.6 (VAS, range 1-5). All patients returned to their previous activities without restrictions.
Conclusions: Scaphoid non-unions in children and adolescents are rare, but on the rise. Arthroscopic treatment of instable scaphoid non-unions shows good clinical results, with a short consolidation period and excellent recovery.

A-0552 SENSITIVITY OF THE OUTCOME MEASUREMENTS USED FOR EVALUATING TREATMENT EFFECTIVENESS IN DUPUYTREN´S DISEASE

Janne Soikkeli[1], Venla-Linnea Karjalainen[2], Mikko Räisänen[3], Olli Leppänen[4], Teemu Karjalainen[5], Susanna Stjenberg-Salmela[6]

[1]Oulu University Hospital, Oulu, Finland; [2]Tampere University, Tampere, Finland; [3]Kuopio University Hospital, Kuopio, Finland; [4]Tampere University Hospital, Tampere, Finland; [5]Hospital Nova, Jyväskylä, Finland; [5]Helsinki University Hospital, Helsinki, Finland[6]

Introduction: Instruments for measuring disability caused by Dupuytren's disease and benefits of the treatment have limitations, most commonly in their responsiveness and psychometric properties.
Aim: The aim of this study was to assess the sensitivity of the outcome measures using data from a large randomized controlled trial.
Material & Methods: We randomized 302 patients to receive either surgery, needle fasciotomy or a collagenase injection and used data from the 3-months and two-year time-points of the trial. In this secondary analysis of the previous trial, we compare treatment effects measured with quick Disabilities for the Arm, Shoulder and Hand (quickDASH), functional Visual Analogue Scale (F-VAS), Global rating of change, satisfaction with treatment, Patient Accepted Symptom Stage (PASS), residual contracture, EuroQol- 5 Dimension 3 Level index (EQ-5D-3L), EuroQol (EQ)-VAS, and a composite outcome, success, defined as the patient being in PASS and at least a 50 % contracture release. We created forest plots for comparing the treatment effects of these outcome measures in each treatment groups. To assess the responsiveness of continuous measures, we calculated the correlation between the measured change and the global rating of change (Spearman´s r).
Results: The composite outcome, comprising both a subjective (satisfaction with current health state) and an objective component (residual contracture), and the global rating of change were the most sensitive to discriminate between the treatments. F-VAS and residual contracture had the best, but only moderate to low, correlation with global rating of change (r=0,4 and r= -0,35 respectively) indicating the best responsiveness of the continuous variables. The responsiveness of quickDASH was weak (r=-0,26).
Conclusions: The composite outcome, success, comprising the objectively measured residual angle and the self-reported satisfaction with the current health state, seems to be a responsive outcome to be used in trials comparing the effectiveness of treatments for Dupuytren´s disease. The use of QuickDASH is not recommended, as it does not discriminate between the treatments and correlates poorly with the subjective improvement.

A-0553 COMPARISON OF POSTOPERATIVE OUTCOMES BETWEEN THUMB CARPOMETACARPAL ARTHRODESIS USING A LOCKING PLATE AND ARTHROPLASTY BY THE MODIFIED YAO METHOD

Yuki Fushimi[1], Takuya Kameda[1], Kazuki Kobayashi[1], Nobuyuki Sasaki[2], Shunsuke Sato[1], Chiharu Nagashima[1], Yoshihiro Matsumoto[1]

[1]Department of Orthopaedic Surgery, Fukushima Medical University, School of Medicine, Fukushima, Japan; [2]Japanese Red Cross Fukushima Hospital, Fukushima, Japan

Introduction: Thumb carpometacarpal (CMC) joint arthritis is one of the most common osteoarthritis. Various surgical treatment procedures for thumb CMC arthritis have been reported. Among them, arthrodesis and arthroplasty are both effective surgical treatments for pain relief and functional recovery, and the superiority of their outcomes has not been clarified. At our institution, arthrodesis using a locking plate and arthroplasty by the modified Yao method have been mainly performed in recent years.

Aim: To compare and discuss the postoperative outcomes of arthrodesis using a locking plate and arthroplasty by the modified Yao method.

Patients & Methods: This retrospective cohort study included 28 thumbs in 24 cases of CMC arthritis treated with either CMC arthrodesis or arthroplasty at our institution between 2015 and 2023. In 19 thumbs of 17 cases (8 males and 9 females, mean age 69.0 years), CMC arthrodesis was performed using a locking plate (VariAx Hand Plating System, Stryker, USA). In 9 thumbs of 7 cases (2 males and 5 females, mean age 63.8 years), CMC arthroplasty was performed using Mini TightRope (Arthrex, USA) with fixation of the bases of the 1st and 2nd metacarpals after arthroscopic partial resection of the trapezium. Postoperative outcomes were evaluated using patient-reported outcome measures by questionnaire (Disabilities of the Arm, Shoulder and Hand [DASH] score and Hand20 score) and compared statistically (Mann-Whitney's U test).

Results: In the CMC arthrodesis group, bone union was achieved in 17 thumbs, with a union rate of 89.5% and a mean time to union of 4 months (range: 2–6 months). In patients who achieved bone union, the mean postoperative DASH score was 27.2 (95% confidence interval [CI]: 11.1–43.2) and Hand20 score was 29.2 (95% CI: 10.0–48.5) at final evaluation (3–12 months postoperatively). In the CMC arthroplasty group, the mean postoperative DASH score was 32.8 (95% CI: 7.7–58.1) and Hand20 score was 30.2 (95% CI: 6.0–54.4), showing no significant difference between the two procedures. Two thumbs in the CMC arthrodesis group that did not achieve bone union showed failure of the plate approximately one month postoperatively.

Conclusions: There was no difference in postoperative outcomes between CMC arthrodesis with bone union and CMC arthroplasty. While CMC arthrodesis using a locking plate showed a high bone union rate, early postoperative failure of a plate and nonunion were potential risks. Therefore, CMC arthrodesis may require more careful postoperative management, such as patient education and longer external immobilization, than CMC arthroplasty.

A-0554 LOCAL ANAESTHETIC PERIPHERAL NERVE BLOCKS TO GUIDE SURGICAL PLANNING FOR THE SPASTIC UPPER LIMB

Petros Mikalef, Mike Craigen, Paul Malone, Dominic Power, Pieter Venter

Birmingham Hand Centre, The Royal Orthopaedic Hospital, Birmingham, UK

Introduction: A considered and detailed pre-assessment technique is crucial when considering surgical interventions for upper limb spasticity. Multiprofessional clinical evaluation, functional tests, patient reported outcomes and response to botulinum toxin chemodenervation form the essential components. In the setting of complex spasticity with high tone,

physical examination findings vary with tonal drivers. Highly focused and often sequential local anaesthetic peripheral nerve blocks are an essential adjunct, providing additional information on myotendinous shortening, joint contractures, intrinsic muscle spastic involvement and unmasking antagonist function. Combined use of these clinical tools gives clinicians the best opportunity to select the most suitable interventions to improve the attitude and function of the affected limb.
Aim: To present the experience of the use of Local Anaesthetic Peripheral Nerve Blocks as a guide for surgical planning for the Spastic Upper Limb at the ROH
Material & Methods: The spasticity service is housed within the Birmingham Hand Centre at the Royal Orthopaedic Hospital, a highly specialised national centre for orthopaedic diseases. Spasticity patients are assessed a specialist multi-professional clinic. The patients are assessed clinically and when necessary, in complex cases, local anaesthetic peripheral nerve blocks using ultrasound and neurostimulation are used to provide additional information in the pre-surgical planning phase.
Results: Since 2011, the spasticity service has provided surgical treatment for 329 patients with complex upper limb spastcity. Local anaesthetic peripheral nerve blocks have become an essential component of the diagnostic and planning pathways, frequently multi-site and multi-nerve starting peripherally with distal ulnar nerve, proximal ulnar nerve, median nerve elbow, musculocutaneous +/- radial and lateral pectoral nerves. The enhanced decision making and learning from this application has increased utility with now approximately 50% of patients have blocks incorporated into their pathway. Blocks provide can confirm 1. Muscle spasticity, 2. Myotenidous shortening, 3. Joint contraction, 4. Agonist function / strength as well as information on patient compliance and acceptability for definitive block anaesthesia surgery. The Birmingham protocol will be illustrated with indicative cases. There are no block related complications (haematoma, nerve injury, neuropathic pain) in the series to date.
Conclusions: Sequential local anaesthetic peripheral nerve blocks using ultrasound and nerve stimulation are a safe and useful component of the diagnostic and planning pathway for management of complex upper limb spasticity.

A-0555 REDUCE TO THE MAX: FROM 37 TO 4 QUESTIONS IN THE MHQ

Kei Mathis[1], Sebastiaan T. Peters[2,4,5], Kevin C Chung[3], Daniel B Herren[1], Miriam Marks[1], Ruud W. Selles[2], Harm P. Slijper[2,4], Robbert M Wouters[2]
[1]Schulthess Klinik, Zurich, Switzerland; [2]Erasmus MC – University Medical Center, Rotterdam, The Netherlands; [3]University of Michigan Hospital, Ann Arbor, USA; [4]Xpert Clinics, Eindhoven, The Netherlands; [5]Xpert Handtherapie, Utrecht, The Netherlands

Introduction: The Michigan Hand Outcomes Questionnaire (MHQ) is a popular patient-reported outcome measure for patients with various hand disorders. However, it has been criticized for its length, with 37 questions, making it time-consuming for patients to complete.
Aim: This study aims to shorten the 37-item MHQ by developing an electronic decision tree version.
Material & Methods: MHQ scores were prospectively collected from 72'869 patients with different hand conditions between January 2011 and December 2021, as part of routine outcome measurements, spanning from baseline to one year post surgery at Xpert Clinics, the Netherlands. The mean age was 58 years, 59% were female, and the treatment was either surgical (71%) or conservative (29%). Using a Chi-Squared-Automatic Interaction Detection (CHAID) algorithm, separate decision trees were created for each MHQ subscale and the MHQ total score. Additionally, the total score was calculated by summing the scores from decision tree versions of each subscale. We used 75% of the data for training and tested the developed models on the remaining 25% of the dataset. We selected the decision tree for each subscale and for the total score with as few items as possible with the criteria that 1) the Intraclass Correlation Coefficient (ICC) with the original score was greater than 0.9 and 2) the median absolute error between the predicted and original scores was below the minimal important change for each subscale.

Results: The number of questions for the decision tree subscales was reduced by 20% to 83% compared to the original questionnaire, depending on the subscale. The number of questions for the total score decreased from 37 to 16 when calculated by summing the decision tree subscales, and from 37 to 4 when predicted by a separate decision tree model. The ICC between the original and predicted decision tree scores ranged from 0.92 to 0.99, with a median absolute error between 0 and 4.2 points. All scores were well below their respective minimal important change. We created a free online tool to calculate the MHQ based on the developed algorithm.
Conclusions: The 37-item MHQ could be markedly reduced to 16 questions when all the subscales were determined and even to 4 items if only the total score was calculated, while maintaining high accuracy. This development is in line with current advances in patient-reported outcome measures which aim to shorten questionnaires and tailor them to patients using specific algorithms. This shorter version, accessible in an online tool, can improve usability, allowing more doctors to assess patients' health and tailor treatments to meet patients' needs.

A-0556 ADULT BOTH-BONE FOREARM SHAFT FRACTURES TREATED WITH COMPRESSION PLATE FIXATION - SYSTEMATIC REVIEW ON ADVERSE EVENTS AND OUTCOMES

Henri Vasara[1,2], Antti Stenroos[2,3], Samuli Aspinen[2,4], Jussi Kosola[2,3], Turkka Anttila[2,4], Panu H Nordback[2,4]
[1]Department of surgery, Central Finland Hospital Nova, Jyväskylä, Finland'; [2]University of Helsinki, Faculty of Medicine, Finland; [3]Department of Orthopaedics and Traumatology, Hyvinkää Hospital, Finland; [4]Department of Hand Surgery, Helsinki University Hospital, Finland

Introduction: Both-bone forearm shaft fractures in adults carry a significant risk for adverse events. There is considerable variance in adverse event incidence reporting, based on the current literature,
Aim: We aimed to systematically review the literature on both-bone forearm shaft fractures in adults treated with compression plate fixation, assessing adverse events and long-term outcomes.
Material & Methods: We performed a systematic review based on the PubMed database on the current literature on adult both-bone forearm shaft fractures treated with open reduction and internal fixation with compression plates. Two authors independently collected the data, and a third author resolved disagreements between the two reviewers. The primary outcome measure was postoperative adverse events, whereas the secondary outcome was to review the long-term outcomes. We evaluated the methodological quality of the studies with a modified version of the Coleman Methodology Score.
Results: Fifteen studies (12 retrospective case series and three randomized controlled trials) met the set inclusion criteria. In total, there were 944 patients, of whom 24% (n=224) experienced some adverse events, and 14% had major adverse events requiring secondary operations or remaining persistent. The most common adverse events were postoperative nerve injuries (incidence 7%, n=64/944), and fracture nonunion (incidence 5%, n=45/944). DASH scores were available for 135 patients (5 studies), with a mean score of 12.5 (Range 0-61). According to the modified Coleman Methodology Scores, there were two good, one fair, and 12 poor quality studies among the included studies.
Conclusions: Both-bone forearm shaft fracture compression plate fixation in adults poses a relatively high adverse event risk (24%). According to available patient-reported outcomes and range of motion measurements, the average postoperative outcomes are good, although a minor disability typically persists to some extent. There is a need for high-quality prospective trials assessing the treatment and outcomes of both-bone forearm shaft fractures in adults to improve forearm fracture treatment.

A-0558 EVALUATION OF INFRASPINATUS MUSCLE DIAMETER AFTER A POSTERIOR SURGICAL APPROACH FOR SCAPULAR FRACTURES: EFFECTS ON PAIN AND FUNCTION OF THE SHOULDER

Farsad Biglari, Mohsen Asadi Shahmirzadi, Farzaneh Ghazi, Mehrdad Sadighi, Amir Sabaghzadeh, Saber Barazandeh Rad, Babak Toloue Ghamari, Meisam Jafari Kafiabadi, Adel Ebrahimpour
Department of Orthopedics Surgery, Shohada-e Tajrish Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Introduction: Scapular fractures are relatively uncommon but can result in significant morbidity.
Aim: Understanding the demographic characteristics, fracture mechanisms, associated injuries, radiological dimensions, and functional outcomes of scapular fractures is crucial for effective management.
Material & Methods: Nineteen participants meeting the inclusion criteria were enrolled in the study. Demographic data, fracture characteristics, associated injuries, and radiological findings were collected. Functional outcomes were assessed using the American Shoulder and Elbow Surgeons (ASES) performance and pain scores. Statistical analysis was performed to explore relationships between variables.
Results: Most participants were male (84.2%), with a mean age of 35.95 years. Motorcycle accidents were the leading cause of fractures (52.6%). Associated injuries were present in 21.1% of participants, with concurrent fractures in the lower extremities being the most common. Radiological evaluation revealed significant differences in infraspinatus muscle diameter between healthy and fractured shoulders with no significant effect on functional outcomes or pain. Functional outcomes were generally favorable, with most participants reporting high ASES scores.
Conclusions: Our study provides valuable insights into scapular fractures by examining key factors such as demographic characteristics, fracture mechanisms, associated injuries, radiological dimensions, and functional outcomes. We have identified noteworthy differences in infraspinatus muscle diameter between healthy and fractured shoulders, which did not significantly affect pain or functional outcomes.

A-0559 OPEN ROTATOR CUFF REPAIR USING WALANT TECHNIQUE: A CASE SERIES

Amir Bisadi, Mohammad Ali Okhovatpour, Farsad Biglari, Amir Sabaghzadeh, Mehrdad Sadighi, Nadia Zameni, Saber Barazandeh Rad, Meisam Jafari Kafiabadi, Adel Ebrahimpour
Department of Orthopedic Surgery, Clinical Research Development Unit of Shohada-e Tajrish Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Introduction: Shoulder pathologies are the third most common source of pain in a human's lifetime; of these, rotator cuff tear is a cardinal culprit. To date, there has been no rigid consensus on the treatment strategies of RCTs, and physicians usually rely on their expertise and experience for the management of this issue.
Aim: The wide-awake local anesthesia technique has gained popularity in recent years; however, the literature lacks data on the management of RCTs implementing WALANT. To the best of our knowledge, only one such case has been published.
Material & Methods: In this study, we aimed to repair the rotator cuff using WALANT to compare the results with the traditional modalities of treatment and discuss the outcome.
Results: Fifteen patients, including seven males and eight females with rotator cuff tears, were enrolled in this study. The average age of the patients was 56 years, and the average tear size was 2.13 cm. The average duration of surgery was 52 min, and the average intraoperative bleeding volume was 15 ml. None of the patients required additional injections during surgery.
Conclusions: WALANT has shown results comparable to those of traditional surgery and can be applied in an outpatient

setting for rotator cuff tears. Experienced surgeons are advised to perform this surgery because a consensus on the step-by-step management of such surgeries has not yet been established.

A-0560 ASSOCIATION BETWEEN OSTEOARTHRITIS OF THE ELBOW JOINT AND THE ONSET, SEVERITY, AND PROGNOSIS OF CUBITAL TUNNEL SYNDROME

Shinya Muramatsu[1,2], Takao Ohmura[2], Kaori Sugiura[2], Yukihiko Matsuyama[2]
[1]Izuimaihama Hospital, shizuoka, Japan; [2]Hamamatsu University Hospital, shizuoka, Japan

Introduction: Osteoarthritis of the elbow (elbow OA) is known as the most common cause of cubital tunnel syndrome (CuTS) in Japan.
Aim: The purpose of this study is to investigate the relationship between elbow OA and the onset, severity, and postoperative prognosis of CuTS.
Material & Methods: Among the patients diagnosed and operated for CuTS at our institute between 2001 and 2021, 101 cases examined with plain X-rays of the elbow (anteroposterior, lateral, and axial) were reviewed. Severity of elbow OA was assessed based on the Kellgren-Lawrence (KL) classification for the medial aspects of the elbow, while CuTS severity was stratified by the McGowan (MG) classification. Comparisons were made between the degree of OA and the severity of CuTS, carrying angle (CA) and the age at the time of surgery.
Results: Based on the KL classification for OA on the medial elbow, there were 28 mild cases (m group, KL grades 1 and 2) and 69 severe cases (s group, KL grades 3 and 4). In terms of CA, the average was 16.6° for the m group and 13.5° for the s group, with the m group showing a significantly larger CA. Preoperative MG classification was Stage I in 16 cases, Stage II in 60 cases, and Stage in 25 cases. Comparing average ages, Stage I was 49.1 years, Stage II was 63.9 years, and Stage III was 67.8 years. Additionally, the average KL classification for the medial elbow was 2.25 for Stage I, 2.93 for Stage II, and 3.16 for Stage III, showing a significantly higher age and OA severity in severe CuTS cases.
A comparison between patients in MG Stage II preoperatively who improved to MG Stage I within a year postoperatively and those who showed no improvement indicated no significant correlation between the severity of elbow OA and recovery.
Discussion: In mild medial elbow OA cases, an increase in CA might contribute to CuTS onset. Although medial elbow OA appears to be a risk factor for the onset and progression of CuTS, it does not seem to be a indicator of poor postoperative prognosis.

A-0561 CLINICAL AND ULTRASOUND FINDINGS ASSOCIATED WITH FAILURE OF NON-SURGICAL TREATMENT IN WRIST GANGLION CYSTS

Cristobal Greene D.[1], Marisol Marti C.[1], Alejandro Opazo Z.[1], Fabiola Rieloff N.[2], Guillermo Droppelman D.[1], Nicolas Garcia A[1]
[1]Clínica MEDS, Santiago, Chile; [2]Hospital de Santa Cruz, Santa Cruz, Chile

Introduction: Ganglion cysts are synovial cysts filled with mucin gelatinous fluid, the most common mass found in the hand and wrist (60-70% of soft tissue masses). Commonly in the dorsum of the wrist, from the scapholunate joint. Their incidence peaks in women between 20-50 years of age, women been three times more likely to develop a cyst. Diagnosis is usually reached by medical history and physical examination, ultrasound is the first or only imaging study performed. Being a benign cyst, treatment ranges between watchful waiting and total surgical resection, but usually the first line procedure is an aspiration, with or without a corticosteroid injection, with efficacy rates that vary widely across the

literature (10-80%). And to date there are no clear factors linked to higher recurrency.
Aim: To describe the clinical and ultrasound characteristics of ganglion cysts more commonly present in patients with failure of non-surgical treatment, most specifically, ultrasound guided aspiration and corticosteroids injection.
Material & Methods: We conducted a retrospective review of the clinical records of patients who underwent an ultrasound guided aspiration and corticoid steroid injection for a ganglion cyst of the wrist, between 2016 and 2021 in our center, who had at least 1 year follow up. We evaluated clinical (gender, age, time since the apparition of the cysts, comorbidities, smoking habit, history of trauma, previous aspirations) and ultrasound characteristics (number of cysts, size, polylobulated or not, presence of calcifications), and reviewed their presence among patients with and without recurrence of the cyst
Results: Our final cohort included 98 patients. 56% were women, the median age was 42 years old, median time since the apparition of the cyst was 6 months, 30% of the patients had comorbidities (hypertension), 40% were smokers, only 10% had a known history of trauma, 23% had a previous aspiration. The ultrasound records showed that most had a single cyst (83%), between 0.5-2.3cm in diameter, only 18 were polylobulated, and none of them had calcifications.
32 patients had a recurrence, of those half were symptomatic, 17 patients required further treatment, with only 6 patients (4 women) undergoing surgical excision.
Among patients with a recurrency, 21 were women, all under 40yo, there were no comorbidities with higher prevalence, the 6 patients who underwent surgical treatment were smokers and had at least 2 aspirations before. 25 of the recurrent cysts were polylobulated and the ones who underwent surgical excision were over 0.9cm in diameter.
Conclusions: Our series showed similar epidemiology and a recurrency of ganglions well within the range demonstrate by the literature. These study showed a tendency of higher failure rates among women, smokers, polylobulated cysts and those with diameters over 0.8cm. 80% of patients who had already had a recurrence after aspiration, had a new recurrence. Although we need bigger cohorts and prospective studies in order to demonstrate the direct effect of every one of the characteristics evaluated in the recurrence rate of ganglion cysts, this characteristics should be studied individually and considered when recommending a treatment plan to patients.

A-0562 3D SIMULATION MODEL FOR SURGICAL EVALUATION OF BRACHIAL PLEXUS TUMORS

Dawn Chia
Sengkang General Hospital, Singapore

Introduction: The brachial plexus is a complex network of interweaving nerve fibres in close relationship and at times coursing through the major blood vessels in the neck and thoracic wall, muscle, bones. Tumors affecting the brachial plexus can be highly variable in location along the brachial plexus. Surgical planning and understanding of the structure of the brachial plexus crucial to obtain a good outcome. We hypothesize that this complex anatomy appreciated when converted from 2D images into a 3D image to aid in surgery.
Aim: Our aim is to study the utility of 3D simulation of brachial plexus tumors in the surgical setting.
Material & Methods: The MRI images of tumors in various locations within the brachial plexus were selected for reconstitution from the 2D images into a 3D simulation model. The simulation model was utilised for pre-operative surgical planning. Additional modalities like 3D printed models, augmented reality 3D projection, and interactive holograms were obtained from the reconstructed 3D simulation model. The authors scored the modalities on its usefulness, accuracy and reproducibility for surgical planning, intraoperative use and patient counselling.
Results: The use of 3D simulation models were found to be relevant and useful for surgical planning and pre-operative patient counselling. Intraoperative use was limited.

Conclusions: The use of 3D simulation models for brachial plexus is shown to be well received by surgeons. It serves the most useful function in preoperative planning. Despite the different ways that 3D simulation can be utilized, the actual intraoperative function remains limited.

A-0563 "CERVICAL RIB RESECTION FOR THORACIC OUTLET SYNDROME: A REPORT OF TWO CASES."

Guillaume Chardon, Wissam El-Kazzi, Georgia Antoniou, Jorg Bahm
Hôpital Erasme Bruxelles

Introduction: Thoracic outlet syndrome (TOS) is a rare condition caused by the compression of neurovascular structures in the cervico-thoraco-brachial region. Cervical ribs, a congenital anomaly found in 0.05–3% of the population, are a significant but uncommon cause. Neurogenic TOS (nTOS) accounts for 95% of cases, often requiring surgical intervention in severe or refractory presentations.
Aim: To describe the successful surgical management of TOS caused by cervical ribs, focusing on the clinical outcomes of patients treated with a supraclavicular approach for cervical rib resection, and to determine the role of cervical rib resection in the management of TOS.
Material & Methods: Two patients with chronic cervical pain, upper limb paresthesias, and weakness underwent comprehensive imaging, including Angio-CT, dynamic MRI, and Doppler ultrasound. Imaging confirmed significant neurovascular compression by cervical ribs. Surgical management involved a transverse supraclavicular approach, facilitating neurovascular decompression and complete rib resection.
Results: In the first case, a 6.5 cm cervical rib caused 70% subclavian artery stenosis. The second case demonstrated posture-dependent nTOS confirmed by dynamic imaging. Postoperatively, the first patient reported complete pain relief (VAS 0) with mild paresthesias during prolonged activity, while the second experienced significant functional recovery and near-complete symptom resolution. Both patients had uneventful recoveries and improved quality of life.
Conclusions: Cervical rib-related TOS, though rare, can cause significant morbidity if untreated. Early diagnosis and precise surgical management are critical. The transverse supraclavicular approach offers optimal anatomical exposure, enabling effective neurovascular decompression and minimizing complications. These cases underscore the value of tailored surgical interventions for rare neurovascular conditions affecting the upper limb.

A-0564 INFLUENCE OF CAPITATE MORPHOLOGY ON FUNCTIONAL AND RADIOLOGICAL OUTCOMES OF PROXIMAL ROW CARPECTOMY

Camille Colombies-Verrier[1], Olivier Freaud[1], Alain Sautet[1], Emmanuel Camus[2], Jean-Gabriel Delvaque[3], Pascal Jehanno[3], Adeline Cambon[1]
[1]Sorbonne University, Orthopaedic and Trauma Surgery Department, Saint Antoine Hospital, Paris, France; [2] IMPPACT, Clinique de Lille Sud, Lesquin, France; [3]Paris Cité University, Hand Surgery Unit, Orthopaedic Department, HEGP Hospital, Paris, France

Introduction: Proximal row carpectomy (PRC) is a potential conservative surgical option for managing painful wrist osteoarthritis of inflammatory, degenerative, or post-traumatic origin, provided the cartilage of the capitate head remains intact. A recognized unfavorable outcome of this procedure is the development of secondary radiocarpal osteoarthritis. We hypothetized that the shape of the capitate head influences surgical outcomes.
Aim: This study aimed to investigate the correlation between the morphology of the proximal pole of the capitate and PRC outcomes in a retrospective series of patients.

Material & Methods: This bicentric retrospective study included 38 patients who underwent PRC without interpositional materials (tendinous or implant-based) between 2000 and 2022. Surgical indications included SLAC or SNAC wrist arthritis, sequelae of perilunate dislocation, and Kienböck's disease. The mean patient age was 47 years (range: 18–75). Patients with less than one year of follow-up or lacking imaging were excluded. The capitate head morphology was classified as flat, round, or pointed based on Yazaki's criteria (2008), using anteroposterior wrist radiographs. Pre- and postoperative assessments included the following clinical outcomes: range of motion (ROM), grip strength, Visual Analog Scale (VAS) for pain, and QuickDASH scores. Radiographic evaluations assessed progression of radiocarpal osteoarthritis according to Culp's classification.
Results: The capitate was classified as round in 13 patients, flat in 18, and pointed in 7. At a mean follow-up of 65 months (range: 12–288 months), the mean flexion-extension arc was 78°, the mean QuickDASH score was 24.45, and mean grip strength was 78.6% (range: 24–144%) of the contralateral side. At final radiographic assessment, 5 patients had no osteoarthritis (Culp stage 0), 14 had stage 2 osteoarthritis, and 19 had stage 3. Two patients with advanced osteoarthritis required reintervention: one received a pyrocarbon interposition implant, and the other underwent total wrist arthrodesis. Patients with pointed capitates reported significantly more pain than those with round or flat capitates ($p = 0.036$) and exhibited weaker grip strength compared to patients with round ($p = 0.035$) or flat capitates ($p = 0.004$). However, the QuickDASH score was not significantly worse in the pointed capitate group ($p = 0.082$). Neither ROM nor the degree of osteoarthritis progression was influenced by capitate morphology.
These findings align with existing literature, indicating that capitate morphology, as assessed on imaging, affects pain levels and grip strength in patients undergoing PRC. The low prevalence of pointed capitate morphology may have contributed to the study's limited statistical power, potentially explaining the lack of significant impact on radiocarpal osteoarthritis progression.
Conclusions: Pointed capitate morphology may be a prognostic factor for poorer functional outcomes following PRC and should be considered in the therapeutic decision-making process and preoperative patient counseling. Further evaluation of this cohort with extended follow-up is necessary to clarify its impact on the risk of osteoarthritis progression.

A-0565 TECHNIQUE OF SINGLE PORTAL ENDOSCOPIC PALMARIS LONGUS HARVEST FOR CAMITZ OPPONENSPLASTY

Suraj Sajeev, Dawn Chia
Department of Orthopedics, Sengkang General Hospital, Singapore

Conventional Camitz opponensplasty for severe carpal tunnel syndrome is a common procedure to restore thumb abduction due to paralysed abductor pollicis brevis by transferring the palmaris longus.In this presentation we would like to describe a technique of harvesting the palmaris longus after performing an endoscopic carpal tunnel release through the same incision thereby reducing surgical access trauma.

A-0566 ENDOSCOPIC CARPAL TUNNEL RELEASE IN DISTAL RADIUS FRACTURE MALUNION

Dawn Chia
Sengkang General Hospital, Singapore

Introduction: Distal radius fractures may distort carpal tunnel anatomy, and are a relative contraindication to endoscopic carpal tunnel release (eCTR).
Aim: This study aims to evaluate the anatomical considerations of eCTR in patients with previous distal radius fractures, and compare the use of open release (OCTR) and eCTR in these patients.

Material & Methods: This is a retrospective study conducted in a tertiary hospital in Singapore between May 2008 and February 2016. This study included all patients aged above 16, with a history of distal radius fractures, who underwent CTR. Parameters studied included patient biodata, risk factors for CTS, AO classification and treatment of the fractures, as well as CTR treatment outcome. Statistical analysis was conducted using the chi-squared test.
Results: Among 1123 patients who underwent CTR, 41 had a history of ipsilateral distal radius fracture. Of these, 68.3% underwent OCTR, and 31.7% underwent eCTR. The eCTR patients most commonly had AO Type A fractures (61.5%), while the OCTR patients most commonly had Type C fractures (46.2%). 61.5% of the eCTR patients had their fractures treated conservatively, while 74.1% of the OCTR patients had undergone open reduction and internal fixation (ORIF). Radiological parameters post-fracture-healing were as follows: average volar tilt -2.6°, average radial height 8.49mm, average radial inclination 17.2°, and average ulnar variance -0.28°. Post-eCTR, all patients experienced improvement in CTS symptoms at final follow-up. The post-operative results of both the eCTR and OCTR patients were comparable.
Conclusions: We recommend that eCTR can be used in the treatment of patients with previous distal radius fractures who now present with CTS.

A-0567 LONG-TERM SURVIVAL ANALYSIS OF 191 SIMPLE MOBILITY PROSTHESES FOR TRAPEZIOMETACARPAL ARTHRITIS

Michel Chammas, Leo Chiche , Pierre Emmanuel Chammas, Paul Vial D'Allais, Cyril Lazerges, Bertrand Coulet
Hand and Upper extremity Surgery Unit, Lapeyronie Hospital, Montpellier University Medical Center, France

Introduction: Surgery for trapeziometacarpal osteoarthritis after failure of medical treatment remains controversial. Few studies published on trapeziometacarpal prosthesis have included postoperative setbacks, with survival curves beyond 10 years.
Aim: The objective of this retrospective cohort study was to determine the long-term survival of the cementless MAIA simple mobility trapeziometacarpal (TM) prosthesis with semi retaining cup at 10 years and beyond.
Material & Methods: This was a retrospective clinical and radiographic study of 191 MAIA trapeziometacarpal prostheses implanted between 2001 and 2016 from a single centre. Kaplan–Meier curves were used to estimate the survival rate against time, with 95% confidence interval.
Results: Of 251 patients, nine patients (nine TM prostheses) died between the surgery and the last follow-up; 67 patients (74 TM prostheses) could not be contacted. 18 patients were (19 prostheses) because of incomplete data. Therefore, 191 MAIA prostheses in 157 patients (mean age 65, range 50-86) were available for the final analysis. The median follow-up was 69 months (range 17 days to 140 months).
Of these 191 prostheses, 12 had already undergone revision surgery at the time of the study. The survival rate of the implants at the final follow-up of 12 years (range 17 days to 140 months) was 88%. Median pain score was 1/10. We did not find any difference in prosthesis survival between those patients who were working and non-working.
The median QuickDASH score was 20. The mean overall satisfaction score was 9/10 (range 2–10). 85% of the participants were satisfied with the appearance of the thumb (mean cosmetic score of 9/10, range 8–10).
The rate of major complications was 9% (5% dislocations and 4% loosening) with all dislocations needing revision surgery. The risk of prosthetic dislocation was highest during the first 3 years, most often related to malposition of the trapezium implant. All 10 dislocations required revision surgery. Nine of the 13 postoperative De Quervain's tenosynovitis patients were successfully treated with nonoperative management, but the remaining four required surgical release.
Conclusions: The survival curve at a final follow-up of 12 years (median 5.8 years) suggests MAIA single mobility total TM

arthroplasty to be a reliable long-term solution for the surgical treatment of thumb osteoarthrosis after failure of medical treatment. However, these data warrant further analysis with survival curve studies beyond 10 years. The position of the cup seems to be of primary importance for prosthesis stability. This series included only the first generation of MAIA prostheses with simple mobility. Newer generations of the dual mobility prosthesis might solve the problem of early postoperative instability, but further studies are needed to confirm this.

A-0568 EVALUATION OF VITAMIN C INJECTION OUTCOMES IN FLEXOR TENDON REPAIR IN ZONE II

Faezeh Tajari[1], Meisam Jafari Kafiabadi[2,2], Farsad Biglari[2,3], Babak Toloue Ghamari[2,4], Adel Ebrahimpour[2,5]
[1]School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran; [2]Department of Orthopedics Surgery, Shohada-e Tajrish Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Introduction: Tendons are connective tissues that attach muscles to bones, playing a critical role in force transmission and joint movement. Tendon injuries, such as inflammation and tears, often result from excessive strain or repetitive movements, leading to pain and reduced functionality. Due to its pivotal role in collagen synthesis and antioxidant properties, Vitamin C has been proposed as a potential supplement to aid in the healing of tendon injuries.
Aim: This study aims to evaluate the effect of Vitamin C injections on tendon tear recovery in patients post-surgery.
Material & Methods: This study was conducted as a randomized controlled clinical trial. A total of 30 patients scheduled for knee tendon repair who met the inclusion criteria were randomly assigned to either the intervention group or the control group. The intervention group received Vitamin C injections after surgery, while the control group received standard care. Outcomes were assessed using range of motion (ROM) metrics and the Strickland Rating Scale (SRS) to compare the recovery results between the two groups.
Results: The findings indicated that both the range of motion and the SRS scores improved in the intervention group that received Vitamin C, compared to the control group. However, these differences were not statistically significant ($p > 0.05$). This suggests that while Vitamin C may accelerate tendon healing, there was no significant distinction between the two groups in terms of measurable recovery.
Conclusions: Given its role in collagen synthesis and reduction of oxidative stress, Vitamin C can be considered a beneficial supplement for tendon injury recovery. However, the results of this study, along with similar research, indicate that there is still insufficient evidence to definitively confirm the effectiveness of Vitamin C in tendon repair post-surgery. Further studies with larger sample sizes and extended follow-up periods are necessary to reach a more comprehensive conclusion.

A-0570 ORTHOSIS FOLLOWED BY TRAPEZIECTOMY FOR THUMB BASE OSTEOARTHRITIS: A COHORT PILOT STUDY ON PAIN AND FUNCTION

Kati Jaatinen[1,2], Jenni Pajari[2], Eero Waris[5], Jarkko Jokihaara[4], Simo Taimela[2], Teppo LN Järvinen[2], Teemu Karjalainen[1,2]
[1]Hospital Nova of Central Finland, Wellbeing Services County of Central Finland, Jyväskylä, Finland; [2]Finnish Centre of Evidence-Based Orthopaedics (FICEBO) Department of Orthopaedics and Traumatology, University of Helsinki and Helsinki University Hospital, Helsinki, Finland; [3]Department of Hand Surgery, Tyks Orto Surgical hospital, Turku University Hospital, Turku, Finland; [4]Division of Musculoskeletal Diseases, Tampere University Hospital, Tampere, Finland; [5]Mehiläinen Helsinki Hospital, Helsinki, Finland

Introduction: Thumb carpometacarpal joint osteoarthritis (CMC-1 OA) is a common painful condition of the hand, with prevalence estimates ranging from 6% to 39% among individuals aged 50 to 80 years. The initial treatment of CMC-1

OA is non-surgical, typically comprising pain medication, hand therapy, and the use of an orthosis. Surgery, generally trapeziectomy with or without ligament reconstruction and tendon interposition, is considered when non-operative treatments do not provide sufficient pain relief.

Aim: This study aimed to estimate the changes in pain and function following conservative treatment with a 6-week orthosis use, followed by trapeziectomy, in individuals with CMC-1 OA. The data on symptom progression and resolution can provide valuable information for patients regarding recovery post-surgery and assist researchers in designing clinical trials to assess the effectiveness of surgery for CMC-1 OA.

Material & Methods: We recruited 52 patients with CMC-1 OA referred for surgical consultation. All eligible and willing patients underwent a 6-week treatment period with an orthosis before trapeziectomy. We collected outcome measures at the time of recruitment, after 6-week use of an orthosis (time of surgery), and 3, 6, 9, and 12 months following the surgery. The Patient Rated Wrist/Hand Evaluation (PRWHE) questionnaire was the primary outcome measure. We used a repeated measures mixed model to estimate the group mean values for continuous outcomes. We compared the estimates with known minimal clinically important difference (MCID) values.

Results: Conservative treatment with a 6-week use of an orthosis resulted in no relief from hand disability and pain. After trapeziectomy, a large and clinically important change occurred at 3 months, and a rapid decrease in symptoms continued until 6 months, at which point it was 3 times the MCID value for PRWHE.

Conclusions: This study provides useful estimates for the trajectory and magnitude of the symptom resolution after trapeziectomy. Conservative treatment with a 6-week use of an orthosis had a negligible impact on symptoms in patients who were referred for surgical consultation. In contrast, a large improvement can be expected after trapeziectomy. However, it remains unclear how much of this change is attributable to the surgery itself.

A-0571 THE DEVELOPMENT OF APEX VOLAR DEFORMITY FOLLOWING VOLAR PLATING OF PEDIATRIC RADIUS FRACTURES

Rachel Lenhart[1], Pille-Riin Värk[2], Keith D Baldwin[1], Christine M Goodbody[1], Jonathan G Schoenecker[3], Apurva S Shah[1]
[1]Division of Orthopaedics, The Children's Hospital of Philadelphia, Philadelphia, USA; [2]Department of Pediatric Surgery, Tartu University Hospital, Tartu, Estonia; [3]Department of Orthopaedics, Vanderbilt University Medical Center, Nashville, TN, USA

Background: Plate fixation in skeletally-immature children can cause angular deformity with longitudinal growth even when the plate does not overlie the adjacent physis. While this phenomenon has been described for distal femur shaft fractures without the involvement of the physis following plate fixation, angular deformity has not been reported following plating in other long bones.

Aim: The aim of the study was to characterize whether sagittal-plane deformity occurs following volar plating of radius fractures in skeletally-immature children and to determine any associated risk factors. This is the first known study to methodically analyze this phenomenon in pediatric radius fractures.

Methods: A retrospective review was completed in children with an open distal radius physis following volar plating of acute radius fracture at a single United States tertiary-care level children's hospital between 2008 and 2022. Records of 315 skeletally-immature patients who underwent volar plating of the radius were reviewed. Demographic and clinical information were extracted from the electronic medical record. Patients without at least four months of follow-up after the surgery were excluded. The first radiograph and the last follow-up radiograph were evaluated for any change in sagittal angulation distal to the volar plate. Linear regression analysis was used to determine if distance from the plate to the physis, follow-up time, age, or coexisting ulnar fracture were predictive of any observed changes in angulation.

Results: Sixty-one acute radius fractures treated with volar plating at a mean age of 12.1 years met the study criteria. Many potential subjects were excluded due to insufficient follow-up. When analyzing by fracture location, 78% (21/27) of the distal third radius fractures developed at least 10 degrees of apex volar angular deformity with 44% (12/27) exhibiting greater than 20 degrees. Middle-third (30/61) and proximal-third (4/61) fractures did not exhibit similar degrees of angulation (13% and 0% with more than 10 degrees of angular deformity, respectively). Overall, 41% (25/61) of patients with radius fracture treated with volar plate fixation developed an apex volar deformity greater than 10 degrees. Linear regression analysis revealed distance of the plate to the physis following surgery and follow-up time to be strong predictors of angulation (both $p < 0.0001$) with closer distance of the plate to the distal physis (≤ 2 cm) and longer follow-up time being related to more angulation.
Conclusions: Apex volar angulation at the distal end of the implant that develops after distal radius plating in children with open physes is an underappreciated phenomenon. The majority of skeletally-immature children with distal radius fractures treated with a volar plate appear to develop at least 10 degrees of apex volar angular deformity. Although there are similarities between deformity development in the femur and radius following plate fixation, the deformity of the distal radius occurs in the opposite direction compared to the femur. These findings challenge the traditional belief of growth impedance following plating and represent a paradigm shift in understanding growth modulation. It also highlights the importance of strict surgical indications and vigilant post-operative monitoring for at least six months.

A-0572 EPIDEMIOLOGY OF HAND OSTEOARTHRITIS AND ITS ASSOCIATION WITH CENTRAL SENSITIZATION: INSIGHTS FROM THE WAKAYAMA HEALTH PROMOTION STUDY

Takashi Shimoe, Yusuke Kido, Akimasa Murata, Yuki Matsuyama, Hiroshi Yamada
Wakayama Medical University, Wakayama, Japan

Background: Central sensitization is a neurological condition implicated in the development and persistence of chronic pain. Hand osteoarthritis (HOA), a common condition characterized by Heberden's and Bouchard's nodules, has yet to be fully explored in terms of its epidemiology and association with central sensitization in the general population.
Methods: This study analyzed 771 participants (351 males and 420 females; mean age 65.9 ± 11.3 years) who underwent health checkups in Wakayama, Japan, in 2019. Diagnosis of Heberden's and Bouchard's nodules was conducted by three hand surgery specialists using visual and physical examinations. Self-reported assessments included the Quick Disabilities of the Arm, Shoulder, and Hand (Quick DASH) questionnaire for upper limb functional impairment and the Central Sensitization Inventory (CSI) for central sensitization. Age- and sex-stratified prevalence rates of HOA, hand pain, and functional impairment were calculated. Multivariate logistic regression was employed to examine associations between hand pain, the number of affected HOA joints, and CSI scores.
Results: HOA was observed in 64.2% of males (224/349) and 67.9% of females (284/418), with prevalence increasing with age. The largest increase was noted in males aged 50–60 and females aged 40–50. Despite the high prevalence of HOA, hand pain was reported in only 6.3% of males (22/351) and 8.3% of females (35/420), suggesting a dissociation between structural changes and symptom presentation. The mean Quick DASH scores were significantly higher in females (7.0 ± 9.9) compared to males (5.4 ± 9.7), with an age-related trend of increased impairment, reaching 11.9 ± 17.0 in males and 18.5 ± 17.8 in females aged ≥ 80 years.
Multivariate analysis revealed that factors significantly associated with higher Quick DASH scores included shoulder pain, arm pain, hand pain, and CSI scores, but not the total number of HOA joints. Conversely, hand pain was significantly associated with both the total number of HOA joints and higher CSI scores.

Conclusions: This study provides novel epidemiological insights into HOA, highlighting its prevalence and the dissociation between structural findings and pain. The association of hand pain with central sensitization underscores the importance of considering neurological factors in the management of HOA. These findings have significant implications for both clinical practice and preventive medicine, emphasizing the need for comprehensive pain management strategies that address central sensitization.

A-0573 A PERSONAL JOURNEY THROUGH SEVERE HAND TRAUMA OF A YOUNG HEART SURGEON

Konstantin Bergmeister, Christina Glisic , Martin Mayrl , Tonatiuh Flores, Giovanni Bartellas, Johannes Mayer, Erol Konul, Berfin Sakar, Klaus F. Schrögendorfer
Clinical Department of Plastic, Aesthetic and Reconstructive Surgery, University Clinic of St. Poelten, 3100 St. Poelten, Austria; & Karl Landsteiner University of Health Sciences, Dr. Karl-Dorrek-Straße 30, 3500 Krems, Austria

Introduction: Severe hand trauma remains a difficult and momentous experience for affected patients. In this presentation, special cases of recent years are presented and their hand surgical peculiarities highlighted
Aim: Personal experiences, failures and learnings are presented as a reminder that these injuries are always a unique reconstructive challenge.
Material & Methods: Suitable cases of severe hand trauma and finger amputations were presented by the following departments: Division of Plastic, Aesthetic and Reconstructive Surgery University Hospital St. Pölten, Division of Plastic and Reconstructive Surgery Vienna General Hospital and Clinic for Hand, Plastic and Reconstructive Surgery BG Clinic Ludwigshafen.
Results: Several exemplary cases are presented with detailed injury pattern, surgical treatment plan and rehabilitation. In particular, the possibilities of ICG angiography, (super-)microsurgical vein interpositions and the special case of traumatized children's hands are presented
Conclusions: Overall, reconstructive microsurgery can often achieve functional reconstruction, but in some cases, there are limits due to the type of trauma. Supplemented by the possibilities of prosthetics, however, almost every patient can be adequately cared for today. Experience shows that patients with hand trauma stay in the best personal treatment for a long time and are often connected to the practitioner for life.

A-0574 ROBOT-ASSISTED SUPERMICROSURGICAL LYMPHEDEMA RECONSTRUCTION

Tom van Mulken, Hendrikje Bettens, Karan Srinadam, Shan Shan Qiu
Maastricht University Hospital, Maastricht, The Netherlands

Introduction: Upper extremity lymphedema is a condition with major impact on the patient's daily life (1). Developments in reconstructive microsurgery have established lympho-venular anastomosis (LVA) as a possible treatment for lymphedema. With super-microsurgical techniques, an anastomosis is made between a lymph vessel and a vein, with an average diameter of 0.3mm- 0.8mm (2). Robotic assistance has the potential to improve surgical precision beyond the manual capabilities of a trained microsurgeon. The MUSA robot, the first dedicated robot for microsurgery, was designed in collaboration of microsurgeons of the Maastricht University Hospital (MUMC+) and technical engineers of the Technical University of Eindhoven, The Netherlands. This prospective randomized pilot trial explores the potential of assistance of the MUSA robot to optimize the outcomes of LVA in upper extremity lymphedema

Aim: This pilot study aims to evaluate the performance of a robot-assisted supermicrosurgery in lymphatico-venular anastomes.
Material & Methods: A prospective randomized controlled pilot study in patients with lymphedema in the forearm and hand was conducted. A total of 60 patients are enrolled, with 30 undergoing robot-assisted anastomosis and 30 receiving conventional microanastomosis by hand. The main outcomes include anastomosis duration and quality, assessed using the Structured Assessment of Microsurgical Skills (SAMS) score, as well as clinical patient outcomes (LYMPH-ICF).
Results: To date, a total of 48 patients have been operated, with 23 in the robotic group and 25 in the manual group. A total of 125 anastomoses were done: 56 using the robot and 69 manually. The mean duration of anastomosis was 16,92 $\pm$ 8,02 minutes in the robotic group and 08,02 $\pm$ 3,47 minutes in the manual group. The duration of anastomosis in the robotic group showed a decrease throughout the study. Clinical outcomes were comparable in both groups
Conclusions: This study shows the feasibility of using the MUSA robot for supermicrosurgical anastomoses in treating upper extremity lymphedema. Patient outcomes were comparable and a gradual decrease in robotic procedure times was seen.

A-0575 FREE FLAPS IN CONTRACTURE RECONSTRUCTION

Agit Sulhan, Yasin Canbaz, Abdullah Colcinar, Erden Erkut Erkol, Percin Karakol
Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, İstanbul Türkiye

Introduction: Contractures are pathological conditions characterized by the shortening and stiffening of skin, muscle, or connective tissue, which limit joint range of motion. They can develop as a result of trauma, burns, neurological disorders, and musculoskeletal diseases, leading to significant functional limitations and a decrease in quality of life. Due to the harmful effects of contractures, health professionals aim to manage this situation with both surgical and nonsurgical methods. Complexity of chronic contractures are needed advanced reconstruction methods for optimal results.
Aim: This study aims to evaluate the techniques and flap types commonly used in the reconstruction of contractures using free flaps and to evaluate their success rates and postoperative functional outcomes. The findings suggest that free flap reconstruction provides high functional success and patient satisfaction while maintaining low complication rates.
Material & Methods: 17 patients with contractures who have operated between February 2022 to September 2024 in this study were recruited from the retrospective chart. Patient characteristics, preferred free flap method, surgery and hospitalization duration, complications, and overall satisfaction during follow-ups were recorded.
Results: 17 patients were reconstructed with a free flap. Major complications were not observed in any of the patients. Minor complications such as partial flap loss, wound dehiscence and hematoma managed closed observation and secondary wound healings. All patients received physiotherapy for at least one month. To demonstrate the efficiency of procedures preoperative and postoperative passive/active range of motion degrees compared and presented. Improvement in ROM degrees was meaningful in all patients ($p<0.05$). Patients also stated a high satisfaction rate in postoperative life quality survey
Conclusions: Surgeons always seek the most suitable reconstruction methods for contracture patients. Various algorithms have been produced to overcome confusion about choosing the most beneficial method for patients. Although the generally preferred algorithm goes from simple to complex methods, some conditions need complex solutions earlier. Therefore, instead of the traditional reconstruction ladder, free flaps can be preferred as the primary option for opening contractures, which is called the reconstruction elevator. Due to optimal results with minimal harm in experienced hands, we believe free flaps present outstanding outcomes.

A-0576 ROBOTIC-ASSISTED SUPERMICROSURGICAL LYMPHEDEMA RECONSTRUCTION

Tom van Mulken, Hendrikje Bettens, Karan Srinadam, Shan Shan Qiu
Maastricht University Hospital, Maastricht, The Netherlands

Introduction: Upper extremity lymphedema is a condition with major impact on the patient's daily life (1). Developments in reconstructive microsurgery have established lympho-venular anastomosis (LVA) as a possible treatment for lymphedema. With super-microsurgical techniques, an anastomosis is made between a lymph vessel and a vein, with an average diameter of 0.3mm- 0.8mm (2). Robotic assistance has the potential to improve surgical precision beyond the manual capabilities of a trained microsurgeon. The MUSA robot, the first dedicated robot for microsurgery, was designed in collaboration of microsurgeons of the Maastricht University Hospital (MUMC+) and technical engineers of the Technical University of Eindhoven, The Netherlands. This prospective randomized pilot trial explores the potential of assistance of the MUSA robot to optimize the outcomes of LVA in upper extremity lymphedema

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Results: To date, a total of 48 patients have been operated, with 23 in the robotic group and 25 in the manual group. A total of 125 anastomoses were done: 56 using the robot and 69 manually. The mean duration of anastomosis was 16,92 $\pm$ 8,02 minutes in the robotic group and 08,02 $\pm$ 3,47 minutes in the manual group. The duration of anastomosis in the robotic group showed a decrease throughout the study. Clinical outcomes were comparable in both groups.

Conclusions: This study shows the feasibility of using the MUSA robot for supermicrosurgical anastomoses in treating upper extremity lymphedema. Patient outcomes were comparable and a gradual decrease in robotic procedure times was seen.

A-0577 TENDON TRANSFERS TO RESTORE EXTENSOR FUNCTION IN RADIAL NERVE INJURIES

Pamela Vergara Garcia[1,2], Alfonso Perez Ihl[1,3], Juan Manuel Breyer Diaz[1,4], Sara Fischer Montt[1], Felipe Arriagada Ramos[1]
[1]Hospital del Trabajador, Santiago, Chile; [2]Clínica Universidad de los Andes, Santiago, Chile; [3]Clínica MEDS, Santiago, Chile; [4]Clínica Alemana, Santiago, Chile

Introduction: Radial nerve injuries (RNI) result in notable disability by affecting wrist and finger extension. Tendon transfers, such as the Pronator Teres to Extensor Carpi Radialis Brevis for wrist extension, Flexor Carpi Radialis to Extensor Digitorum Communis for finger extension, and Palmaris Longus to Extensor Pollicis Longus for thumb extension, are valuable options for restoring function.

Aim: To describe the epidemiological characteristics and functional outcomes of patients who underwent tendon transfer to restore wrist and finger extensor function.

Material & Methods: A descriptive, retrospective study was carried out on patients aged over 18 years with Radial Nerve Injury (RNI) who underwent Tendon Transfer (TT) for restoring extensor function between 2015 and 2023. Patients with incomplete medical records and/or follow-up periods of less than 3 months were excluded. The study evaluated demographic characteristics, nerve injury level, injury mechanism, specific tendon transfer procedures, extensor function based on the Medical Research Council (MRC) scale, re-operation requirements, time taken to return to work post-surgery,

and the QDASH score at the end of the follow up period. Frequency, central tendency, and dispersion measures were employed for analysis.
Results: A total of 21 patients were included, with 18 males and a mean age of 36 years (range 19-60). 86% of the patients were eligible for workers' compensation. The distribution of nerve injuries level was as follows: brachial plexus (19%), radial nerve (57%), and posterior interosseous nerve (24%). In 47% of the patients, the nerve injury mechanism was associated with a humeral shaft fracture. The time from the initial injury to surgery ranged from 90 days to more than 5 years, with a median of 342 days. Pronator Teres to Extensor Carpi Radialis Brevis tendon transfer was performed on 14 patients, resulting in over 86% of them achieving >M3 or higher wrist extension function. Tendon transfer from Flexor Carpi Radialis to Extensor Digitorum Communis was carried out on 20 patients, resulting in over 95% of them achieving M3 or higher finger extension function. Palmaris Longus to Extensor Pollicis Longus tendon transfer was performed on 20 patients, resulting in over 90% of them achieving M3 or higher thumb extension function. Four cases required further surgical interventions: 2 tenolysis, 1 wrist arthrodesis, and 1 tendon repair due to tendon rupture. After surgery, the average time off work was 188 days. The duration ranged from 82 to 718 days. The average QDASH score at the end of the follow-up period was 49.3.
Conclusions: Tendon transfers are an effective approach for restoration wrist and finger extensor function, with low re-operation rates and facilitating prompt functional recovery.

A-0578 THE USE OF PROPELLER PERFORATOR FLAPS IN THE UPPER EXTREMITY FOR SOFT TISSUE DEFECTS

Sophia Syngouna, Panagiotis Kanellos, Georgios Tetsios, Labros Metaxas, Ioannis Aifantis, Emmanouil Fandridis
Hand, Upper Limb & Microsurgery Department, KAT Hospital, Athens Greece

Introduction: Upper extremity trauma often results skin contracture or deficit. The use of a Perforated Pedicled Propeller Flap, according to the Tokyo consensus, is a useful tool for coverage of small and medium defects for the upper extremity, especially in cases of anatomic areas where the skin elasticity is limited.
Aim: The aim of this study is to present the refined technique of the propeller perforated flap rotated 180 degrees that was used in patients with severe skin defects due to open fractures, osteomyelitis or severe nerve trauma.
Material & Methods: From December 2022 to September 2024, 7 patients, 5 men, 2 women with a mean age of 34 years (range: 21–47 years), were treated with severe skin and soft tissue defect. Among them, 4 patients presented open fractures of the elbow and the forearm -2 among them debridement of an exposed olecranon implant, 2 patients' osteomyelitis of the olecranon and 1 patient median nerve trauma zone V.
In all cases, the regional soft tissues were insufficient for adequate coverage. In 5 cases where the anatomic defect concerned the elbow and upper forearm the flap designed used a brachial artery perforator (BAP) and in 1 case the inferior ulna collateral artery perforator (IUCAP). For the patient with the skin contracture after median nerve trauma in Zone V, the Ulnar artery perforator (UAP) flap was chosen. All flaps were meticulously dissected with consideration of the size, the position, the orientation and the anatomy of the recipient region and rotated 180 degrees counterclockwise in the 6 cases and clockwise in the case of the UAP flap, to cover the defect of the soft tissue of the upper extremity.
Results: In all 7 cases, the skin and soft tissue defects were succesfully resurfaced. The technique used was simple with excellent post-operative results both functional and aesthetic. The use propeler perforated flaps is limited in the same limb nevertheless gives the surgeon multiple design options in one stage surgery with early mobilization and limited hospitalisation
Conclusions: In our experience, the use of a perforator propeller flap in the upper extremity for reconstruction and resurfacing, is reliable technique with good functional and aesthetic results.

A-0579 ASSESSMENT OF TRICEPS MUSCLE STRENGTH FOLLOWING BONE GRAFT HARVEST FROM THE OLECRANON USING A MOSAICPLASTY ROD

Okyar Altaş[1], Zeynep Hoşbay[2], Başak Sude Ağtaş[3], Alperen Elibol[1], İsmail Bülent Özçelik[4], Egemen Ayhan[1]
[1]Başakşehir Pine and Sakura City Hospital, Istanbul, Türkiye; [2]Biruni University, İstanbul, Türkiye; [3]Üsküdar University, Istanbul, Türkiye; [4]Yeni Yüzyıl University, GOP Yeni Yüzyıl Hospital, İstanbul, Türkiye

Introduction: For bone autograft harvesting, areas such as the ilium, trochanteric region, proximal tibia, distal radius, and olecranon are used. Donor site complications include pain, local hematoma, incisional hernia, hypoesthesia, and even fractures. In upper extremity surgery, generally less bone graft is needed than in the lower extremity, making the ipsilateral olecranon a safe, convenient donor site.

For harvesting bone grafts from the olecranon, conventional open surgery, a trephine biopsy needle, or, as in our study, a mosaicplasty donor harvester may be used. Studies comparing open surgery and trephine biopsy needle for olecranon graft harvesting found less early postoperative pain with the trephine biopsy needle. No difference in elbow joint range of motion was observed between the methods. A review of literature found no studies evaluating postoperative elbow extension strength in patients undergoing either method.

Aim: Our study aims to evaluate elbow function following autograft harvesting from the olecranon using a mosaicplasty donor harvester, specifically addressing whether triceps function is impacted.

Material & Methods: Our study includes patients from January 2021 to 2024 who required bone grafting in hand and wrist surgery and had bone grafts harvested from the olecranon using either 4mm or 6mm mosaicplasty donor harvesters. Patients who underwent autograft harvesting from the olecranon with the mosaicplasty rod, completed at least 6 months of postoperative follow-up, and had no pre-surgical elbow pathology were included, while those who did not wish to participate, were lost to follow-up, or could not be reached were excluded from the study.

Collected variables include demographic data, operation duration, fluoroscopy count, intraoperative and postoperative complications, extremity dominancy, goniometric elbow range of motion, elbow extension strength (using the Microfet 2 dynamometer), patient-rated elbow evaluation (PREE) scale, visual analogue scale scores, and cosmetic outcomes.

Results: The study currently includes 36 patients, though data collection continues, and only 7 patient records are complete so far. Of these, 6 are female, and 1 is male. The average age is 35.83, with a follow-up period averaging 400.17 days. The average PREE score is 36.81, with mean VAS scores of 2.86 at night, 1.27 at rest, and 4.57 during movement. The graft harvesting time averaged 6 minutes, with 6 fluoroscopic images. An average strength loss of 7 newtons was observed on the grafted side, which was statistically significant. No patient had limitations in elbow extension, and all reported cosmetic satisfaction

Conclusions: These findings suggest that olecranon autografts harvested with the mosaicplasty rod are surgically safe, efficient, and yield favorable cosmetic results. The study is ongoing, with current data indicating a reduction in triceps strength post-surgery. No impact on elbow extension range was observed with this method in current results, and triceps strengthening exercises should definitely be included in the postoperative program.

A-0580 OSTEOLYSIS AFTER INTERPOSITION ARTHROPLASTY WITH POLY-L/D-LACTIDE 96/4 IMPLANT IN PATIENTS WITH OSTEOARTHROSIS OF THE THUMB CARPOMETACARPAL JOINT

Jerneja Vidmar, Aljaž Toš, Minja Gregorič
Department of Plastic, Reconstructive Surgery and Burns, University Medical Centre Maribor, Maribor, Slovenia

Introduction: Osteolysis of adjacent bones has been reported in some studies as an important and frequent drawback of interposition arthroplasty with RegJointTM implant (bioabsorbable poly-L/D-lactide 96/4, Scaffdex, Finland) in patients with osteoarthrosis of the thumb carpometacarpal joint, which led to clinical problems and reoperations. Osteolysis was attributed to foreign-body reaction. There were other studies published on short term and long term results of these operations, that did not reveal problems with osteolysis. Because of controversial results of previous studies we aimed to get a deeper insight into this phenomenon analysing our large series of patients.

Methods: In this retrospective study we analysed 122 cases in which interposition arthroplasty with RegJointTM implant was performed with resection of the base of the first metacarpal bone and/or distal part of trapezium or total trapeziectomy. Base of the first metacarpal bone was fixed to the base of the second metacarpal bone or to carpal bones with K wire for 4-5 weeks. Continuous immobilisation with thumb spica splint for 4 to 5 weeks was performed as well. Physiotherapy followed after removal of K wire and splint. Follow up was inconsistent after physiotherapy, there were more visits in patients with complaints.

122 cases were examined in October 2024. Demographic data, data on systemic diseases and on the course of treatment were collected. Range of motion and muscle strength were measured. Wrist radiographs were obtained. PEM and Quick-DASH questionnaires were completed.

Results: 168 cases were operated with RegJointTM implant at our department between November 2014 and June 2024. 122 cases were available for follow up in October 2024. 106 were female and 16 were male patients. Osteolysis was present in 58 cases (47,5%). It was most frequently present at the base of the first metacarpal bone and at trapezium (29 cases, 50%). In 20 cases (34,5%) it was present at the base of the first metacarpal bone alone and in 9 cases (15,5%) only in trapezium. There was a positive correlation between the area that was resected (base of the first metacarpal bone or/and distal part of trapezium) and area in which osteolysis appeared. Osteolysis appeared as soon as 3 months after the operation. There was no correlation between osteolysis and symptoms or signs of foreign-body reaction. Revision was performed in 4 cases (revision rate 3,3%) for persisting pain.

Conclusions: As far as we know this is the largest published follow up series of patients with osteoarthrosis of the thumb carpometacarpal joint operated with RegJointTM implant.

Osteolysis of adjacent bones after interposition arthroplasty with RegJointTM implant in patients with thumb carpometacarpal joint osteoarthrosis is more frequent in our series than previously reported in many studies. It starts earlier that previously reported but it rarely has any clinical importance. Revision rate was low. When following patients with osteolysis further, we noticed that osteolytic area calcified with time. There was no correlation to patient`s systemic diseases. Location of osteolysis correlated to the location of bone resection.

A-0582 FIX AND PLAY: HAND THERAPY NEXT DAYS AFTER HAND FRACTURES SURGERY

Claudiu Jaba
Daniel Vilcioiu
Hand Surgery Clinic, Bucharest, Romania

Introduction: Phalangeal fractures are most often categorized according to the level at which they occurred, the type and joint involvement of the fractured fragments. These fractures are among the most common types of upper limb fractures. The postoperative recovery and prevention of complications is mainly based on the understanding of the healing processes but an important role is also attributed to the experience of the physiotherapist.
Aim: To demonstrate that rehabilitation is faster in hand fractures, with minimally invasive k-wire fixation and hand therapy next days post operative.
Material & Methods: A total of 69 patients, with various finger fractures, aged between 18 and 53 years, were treated in the Hand Surgery Clinic in Bucharest, between September 2021 and September 2024. Of these, 9 met the selection criteria: surgery was performed in the first 10 days post trauma, osteosinthesis was made with k wire, we start rehabilitation in first 2 weeks post operative
Results: The average total passive motion (TPM) at 3 months postoperative was 261 degrees, while the healthy limb had a total of 278 degrees. The average strength was 38.5 kgf, while at the affected limb, it was 31.4 kgf, resulting in a difference of 7.1 kgf. DASH score at 3 months, during daily activities was 10 out of 100, indicating that the patients had no more difficulty in carrying out daily activities.
Conclusions: A correctly conceived and executed rehabilitation plan tailored to the patients' needs is essential for a fast recovery, while minimising long-term sequelae and postoperative complications.

A-0583 DEVELOPMENT OF A NOVEL TECHNIQUE TO OVERCOME ERROR IN ESTIMATION OF PARTIALLY LACERATED FLEXOR TENDONS

Quentin Jeantet, Shirley Potter
Mater Misericordiae University Hospital, Dublin, Ireland

Introduction: The hand is one of the most important tools we possess. Tendons are essential structures to move our fingers to thereby provide function to the hand. Tendon injuries are the second most common hand injury. As our knowledge and repair techniques are improving, outcomes following injuries are improving, however morbidity still exists. Recent evidence is changing the current accepted threshold for repair of partial flexor tendon lacerations. Most surgeons currently assess the degree of laceration subjectively, yet the accuracy of this method has seldom been studied
Aim: This study aims to perform a review of the literature on the subject, assess inter-observer variability in the subjective assessment of partially lacerated tendons based on surgical experience and to develop a novel objective, reproducible technique to assess degree of partial tendon lacerations
Material & Methods: A porcine model was used to create 15 partial tendon lacerations. Participants were split into three groups based on surgical experience (experts, intermediates, and novices). Participants recorded their subjective estimation of the degree of each partial tendon laceration. An objective measurement was obtained using a novel suture technique. Finally, the actual surface area of the laceration was calculated; and the accuracy of each group compared to actual measurements
Results: Sixteen surgeons were recruited. High interobserver variability was noted. Experts were more accurate than

novices at assessing the degree of partial tendon laceration. There was a statistically significant difference between the subjective and objective assessments of degree of partial tendon laceration ($p<0.05$), and no statistical difference between either subjective or objective methods compared to the actual measurements ($p>0.05$).
Conclusions: The data suggest expert surgeons were most accurate at assessing degree of partial tendon laceration. Subjective or objective assessments do not differs significantly from actual measurement of degree of tendon laceration. We have developed a simple technique to provide an accurate objective measure of degree of partial tendon laceration. This will improve diagnostic accuracy and reduce morbidity from unnecessary repairs.

A-0584 POSTOPERATIVE IMAGING EVALUATION OF ULNAR WRIST PAIN

Alvaro Cerezal[1], Ana Canga[2], Luis Cerezal[3]
[1]La Paz University Hospital, Madrid, Spain; [2]Marqués de Valdecilla University Hospital, Santander, Spain; [3]DMC, Santander, Spain

Introduction: Ulnar-sided wrist pain is the most common clinical presentation involving the wrist and encompasses a broad differential diagnosis. Arthroscopy is the gold standard for diagnosing and treating ulnar-sided wrist pathologies. Postoperative evaluation is generally limited to serial clinical and radiographic follow-ups. In fracture management, CT is well established in clinical practice to assess healing, hardware positioning, and associated complications. Imaging studies, including ultrasound, CT, MRI, and arthrographic techniques (CT and MR arthrography), are often performed in non-standardized settings, particularly for occupational or medico-legal cases. The role of advanced imaging techniques in evaluating postoperative articular and periarticular structures, such as the TFCC, capsule, tendons, or ligaments, still needs to be defined.
Aim: This presentation reviews the indications for various imaging techniques in the postoperative assessment of ulnar-sided wrist pain, the normal postoperative findings, and imaging findings in the main postoperative complications.
Materials and Methods: A retrospective analysis was conducted on 174 patients surgically treated for ulnar-sided wrist pain between January 2020 and December 2022. Of these, 142 underwent arthroscopic surgery, while 32 underwent open or combined surgical approaches. Postoperative follow-up included clinical evaluation and imaging studies (radiography, ultrasound, CT, MRI, CT arthrography, and MR arthrography) over a minimum period of 18 months. Postoperative imaging findings and their evolution were analyzed, along with postoperative complications.
Results: Patients presented with a wide spectrum of intra- and extra-articular pathologies responsible for ulnar-sided wrist pain. In 38 patients (23%), multiple etiologies were identified as contributors to wrist pain.
Intra-articular lesions ($n = 160$; 92%) included:

- Traumatic TFCC injuries: 79 cases (45%)
- Ulnar impaction syndrome: 64 cases (37%)
- Ligamentous injuries: 12 cases (7%)
- Pisotriquetral joint disorders: 5 cases (3%)

Extra-articular pathologies ($n = 44$; 25%) included:

- Osseous injuries: 14 cases (8%)
- Tendinous injuries: 18 cases (10%)
- Ulnar nerve neuropathy: 7 cases (4%)
- Vascular injuries: 5 cases (3%)

Postoperative findings such as bone or soft tissue edema, ferromagnetic artifacts, thickening, and altered signal of the TFCC, joint capsule, ligaments, or tendons are considered normal and should not be misinterpreted as pathological.

Postoperative complications were observed in 24 patients (14%).
Major complications included:

- Surgical technique defects (11 patients):
- Dorsal sensory branch of the ulnar nerve injuries (3 cases)
- Ulnocarpal impaction secondary to simple TFCC debridement (2 cases)
- Incomplete or over-resection in a Wafer procedure (2 cases)
- Malpositioned TFCC foveal reinsertion (2 cases)
- Non-Palmer TFCC injuries not addressed in the arthroscopic procedure (2 cases of dorsal capsular detachment)
- Suture or screw failure (6 cases)
- ECU stabilization failure (2 cases)
- Arthrofibrosis (3 cases)
- Complex regional pain syndrome (1 case)
- Infection (1 case)

Conclusion: Ulnar-sided wrist pain often involves a combination of intra- and extra-articular pathologies, with traumatic TFCC injuries and ulnar impaction syndrome being the most common etiologies. Most patients can be managed postoperatively with serial clinical and radiographic follow-ups. CT is essential for assessing fracture healing and associated complications, while MRI is the most valuable tool for detecting suspected postoperative complications. Ultrasound, with its advantage of dynamic assessment, is beneficial for evaluating postoperative ECU instability.

A-0585 DOES TRAPEZIOMETACARPAL PROSTHESIS PROVIDE BETTER METACARPOPHALANGEAL STABILITY THAN TRAPEZIECTOMY AND LIGAMENTOPLASTY?

Benjamin Degeorge, Louis Dagneaux, Julien Andrin, Cyril Lazerges, Bertrand Coulet, Michel Chammas
Hand and Upper extremity Surgery Unit, Lapeyronie Hospital, Montpellier University Medical Center, France

Introduction: Surgery for trapeziometacarpal osteoarthritis after failure of medical treatment remains controversial. Metacarpophalangeal (MP) hyperextension, directly due to the shortening of thumb, trapeziometacarpal subluxation and first web space retraction appears to be a factor of poor prognosis.
Aim: The aim of our study was to evaluate and compare the correction of metacarpophalangeal hyperextension by trapeziometacarpal ball and socket prostheses (Maïa Lépine group, Genay, France) (TMP) compared with trapeziectomy with ligamentoplasty (TL) in patients operated on for trapeziometacarpal osteoarthritis.
Materials and methods: We retrospectively reviewed a series of 41 TMP (41 patients, mean age 66, SD 6.5) and 28 TL (28 patients, mean age 58, SD 7). This series was divided in 4 subgroups according to the degree of metacarpophalangeal hyperextension: $<10°$, between 10 and 30°, greater than 30° and total hyper-extension (THE) group $>10°$. A postoperative evaluation was carried out includng: pain, mobility of the trapeziometacarpal and metacarpophalangeal joints, grip and pinch strength. We assessed dynamic MP instability in hyperextension while the patient used the pinch GaugeThumb height was measured on radiographs as a post/preoperative ratio.
Results: The mean follow-up was 20 months (6-38). Preoperatively, MP hyperextension was diagnosed in 42 patients (61%): respectively 27 and 15 patients in TMP and TL groups. Postoperatively, hyperextension instability was observed in 11 cases (14%) with improvement in 47%. The postoperative hyperextension was measured lower in the TMP group than in the TL group (0.9 versus 4,8, $p = 0.026$). The subgroup with hyperextension greater than 30° and THE subgroup of TMP showed a significant greater reduction of hyperextension than the subgroups of the TL group ($p = 0.002$ and $p = 0.012$, respectively).

Postoperative dynamic MP instability was diagnosed in 28 patients (41%): respectively 7 (17%) and 21 (75%) patients in TMP and TL groups ($p < 0.001$). Dynamic MP instability was measured lower in the TMP group than in the TL group (4,0º versus 17,9º, $p < 0.001$). All subgroups from the TMP group showed significant lower MP instability than the subgroups of the TL group

The TMP group showed significant greater pinch strength in all the subgroups with preoperative MP hyperextension. Patient with postoperative MCP hyperextension had a significant lower grip and pinch strength compared with patient without MCP hyperextension.

On radiographs, in the TMP group, all patients showed a postoperative increase in thumb height, with a mean ratio of 1.09 (SD 0.04, $p < 0.001$). Conersely, all patients in the TL group showed a postoperative loss of height, with a mean ratio of 0.92 (SD 0.03, $p < 0.001$). In both groups, thumb height changes were related to the degree of preoperative hyperextension (Table 3, $p < 0.001$).

Conclusions: Metacarpophalangeal hyperextension appears to be a factor of poor prognosis for surgical treatment of trapeziometacarpal osteoarthritis when it is not managed. TMP provides better metacarpophalangeal stabilization by restoring thumb length and would avoid surgery on the metacarpophalangeal joint. TMP may be recommended in patients having symptomatic trapeziometacarpal joint osteoarthritis and MCP joint hyperextension.

A-0586 EFFECTIVENESS OF CARBOXYMETHYLCELLULOSE AND POLYETHYLENE OXIDE GEL IN PREVENTING ADHESIONS IN POST-TRAUMATIC TENDON AND NERVE INJURIES OF THE UPPER LIMB: A RETROSPECTIVE STUDY

Franco Bassetto, Niccolò Battistelli, Stefano L'Erario, Cesare Tiengo
Clinic of Plastic, Reconstructive and Aesthetic Surgery, Padua University Hospital, Italy

Introduction: Scar adhesion formation is a frequent long-term complication in patients undergoing hand surgery, resulting from fibrotic tissue development between structures at the surgical site during postoperative healing. These adhesions, particularly peritendinous and perineural, can severely impair hand functionality. Peritendinous adhesions limit hand mobility, while perineural adhesions can lead to nerve conduction disorders, causing pain, stiffness, and functional limitations. These complications contribute to progressive muscle atrophy due to inefficient muscle contractions. This study aims to evaluate the effectiveness of a carboxymethylcellulose (CMC) and polyethylene oxide (PEO) anti-adhesion medical device in preventing adhesions in traumatic tendon and nerve injuries of the upper limb.

Aim: Building on promising literature supporting CMC and PEO as anti-adhesion agents, this study retrospectively analyzes cases treated at the Plastic Surgery Clinic of Padua University. The goal is to assess long-term outcomes of CMC and PEO gel infiltration in preserving mobility, reducing pain, and maintaining sensitivity in patients undergoing tenolysis and neurolysis following trauma.

Material & Methods: Patients treated with the CMC and PEO anti-adhesion device during post-traumatic revision surgeries in the Plastic Surgery Unit from 2015 onward were included. The follow-up study, conducted in April-May 2024, re-evaluated patients to determine residual disability and persistent pain, with assessment tools including the Visual Analog Scale (VAS) for pain, Quick Disabilities of the Arm, Shoulder, and Hand (qDASH) for functional impairment, and DN4 questionnaire for neuropathic pain symptoms.

Results: Analysis indicated favorable outcomes, with significant reductions in painful symptoms (average -0.7 points on the VAS scale). Symptoms consistent with neuropathic pain decreased by 40% in patients who initially reported them, and disability scores dropped by an average of 20 points on the qDASH scale, demonstrating the device's effectiveness in managing post-traumatic hand injuries.

Conclusions: The CMC and PEO anti-adhesion medical device significantly reduced disability and pain in patients with tendon and nerve trauma in the upper limb, showing potential as a valuable intervention for adhesion prevention in hand surgery. This device, approved for clinical use in over 50 countries since 2020, offers a promising adjunct to established methods for adhesion prevention. However, randomized controlled trials are needed to further establish the long-term efficacy of CMC and PEO use compared to the current gold standard in adhesion prevention.

A-0587 OUR EXPERIENCE ON ELBOW ARTHROPLASTY IN ELDERLY PATIENTS WITH COMPLEX DISTAL HUMERAL FRACTURES. A RETROSPECTIVE REVIEW

Luis Navarro-Paez, Óscar Izquierdo-Corres, José Torres-Darias, Juan Castellanos-Robles, Pilar Aparicio
Parc Sanitari Sant Joan de Déu, Sant Boi, Barcelona

Introduction: distal humeral fractures are complex injuries that often require surgical intervention. In cases where internal fixation is not feasible or effective, elbow arthroplasty is an increasingly used treatment option. However, the outcomes of total elbow arthroplasty following distal humerus fractures remain a subject of ongoing evaluation.
Aim: This study aims to review the clinical outcomes and complications associated with elbow prostheses implanted in patients with distal humeral fractures at our hospital.
Material & Methods: A retrospective review was conducted on patients who underwent elbow arthroplasty after distal humeral fractures between 2014 to 2024. Functional outcomes and postoperative complications were analyzed
Results: nine patients with a mean age of 78, years (62-89) who underwent elbow arthroplasty were analysed. The average follow up was 1,3 years (83-87). Overall postoperative range of motion at final follow-up was 140º of flexion, and -16º of extension, requiring mean time of 4 days of hospital stay. One patient developed an acute prosthetic infection, requiring debridement and antibiotic treatment with implant retention. There were two cases of triceps rupture, one of which required a surgical reconstruction with allograft. Another patient presented an osteolysis in the ulnar component, (in the waiting list to be revised). Despite the complications above mentioned, all patients (except the patient of the osteolysis) were satisfied with the final outcomes.
Conclusions: Overall, elbow arthroplasty represents a viable option for elderly patients with complex distal humeral fractures. However, this technique requires a learning curve and complications may be present. Future studies with larger sample size and longer follow-up periods are essential to further assess long-term outcomes.

A-0588 ADVANCES IN RECONSTRUCTION TECHNIQUES FOR FIRST WEB SPACE DEFECTS: A COMPARATIVE ANALYSIS FROM PEDICLED TO MICROSURGICAL FLAPS

Cesare Tiengo[1], Stefano L'Erario[1], Filippo Perozzo[1], Benedetta Scucchi[1], Franco Bassetto[1], Francesco Messana[2]
[1]Clinic of Plastic, Reconstructive and Aesthetic Surgery, Padua University Hospital, Italy; [2]Clinic of Plastic, Reconstructive and Aesthetic Surgery, San Bortolo Hospital, Vicenza, Italy

Introduction: The first web space of the hand plays a pivotal role in the functional integrity of the upper limb, enabling essential movements like pinching, grasping, and opposition. Its complex anatomical structure makes it highly susceptible to deformities resulting from trauma, burns, or congenital anomalies. Effective reconstruction of this region is critical to restoring hand functionality, but the wide spectrum of defects and their unique challenges necessitate a tailored approach.
Aim: This study aims to provide a comparative analysis of reconstructive techniques for first web space defects, ranging

from traditional pedicled flaps to advanced microsurgical options. The focus is to evaluate their indications, outcomes, and limitations in achieving optimal functional and aesthetic results.
Material & Methods: This study combines a systematic review of the literature with a retrospective analysis of 18 patients treated at our institution. The mean age of the patients was 44 years. Of these, 80% sustained burn injuries, and 20% suffered crush injuries, resulting in complex hand defects requiring reconstructive surgery. Pedicle flaps were performed in 10 cases, including 8 posterior interosseous flaps for medium dorsal defects and 2 radial forearm flaps for larger defects requiring pliable coverage. Microsurgical flap transpositions were employed in 9 cases, including 9 anterolateral thigh (ALT) flaps for extensive soft tissue reconstruction and 1 second toe web space flap for intricate reconstructions preserving mobility. Additionally, 6 urgency flaps were performed in mangled hands as emergency coverage to ensure vascular supply and reduce infection risks. Functional recovery (range of motion, grip strength), aesthetic outcomes, and complications (flap loss, donor-site morbidity) were evaluated, with all patients monitored postoperatively for up to 12 months.
Results: Local flaps, including Z-plasties and dorsal metacarpal artery flaps, were effective for mild to moderate defects, offering simplicity and preserving adjacent tissues. However, they were limited by flap mobility and tissue availability in larger defects. Microsurgical free flaps, such as ALT and SCIP flaps, demonstrated superior versatility and reliability in addressing severe defects. The ALT flap emerged as the preferred choice for its long pedicle, large coverage area, and compatibility with the recipient site. The SCIP flap offered excellent outcomes for smaller defects due to its thin, pliable skin, but posed challenges in terms of shorter pedicle length. Free foot web flaps provided the best anatomical and functional match for first web reconstruction, although their complexity and donor site morbidity required careful patient selection.
Conclusions: First web space reconstruction demands a thorough understanding of the anatomy, defect characteristics, and available techniques. While local flaps remain the cornerstone for simpler defects, microsurgical flaps are indispensable for severe and complex reconstructions. The ALT and SCIP flaps are versatile options for various defect sizes, while foot web flaps offer unparalleled like-with-like restoration for select cases. A multidisciplinary approach and expertise in microsurgery are essential for achieving optimal outcomes. Future research should focus on refining techniques to minimize donor site morbidity and enhance functional recovery.

A-0589 USE OF LAYERED BIODEGRADABLE TEMPORISING MATRIX (BTM) IN TRAUMATIC FINGERTIP AMPUTATION RECONSTRUCTION

Jean Yang, Woo A Kim, Patrick Goon
East and North Hertfordshire NHS Trust, Lister Hospital, Stevenage, UK

Introduction: Crush injuries to the fingertip are a common injury that can occur in various settings in all ages. This type of injury can result in significant tissue damage and disfigurement, which can have a marked impact on the patient's quality of life. Traditional techniques for managing fingertip injuries with exposed deep structures often provide patients with suboptimal results. In this case report, we present a method of fingertip amputation reconstruction using serial BTM application and full thickness skin grafting with good aesthetic and functional outcomes.
Case presentation: We present a case of a 21-year-old female who sustained a severe crush injury to her left ring finger tip caused by a crush in a heavy fire door. This resulted in a total fingertip degloving injury distal to the distal interphalangeal joint with bone exposure.
The patient was a young, healthy university student who understandably expressed concerns regarding the long-term consequences of her severe fingertip injury in terms of both aesthetics and functionality. Following extensive deliberations with the patient, our hand surgery team arrived at a consensus: to reconstruct the fingertip defect with Biodegradable

Temporising Matrix (BTM) aiming to maintain the length and restore the glabrous pulp contour.
The patient underwent two serial BTM applications to achieve the desired volume and length of the fingertip under local anaesthetic. The BTM application was performed four weeks apart with each stage allowing the material to undergo dermal integration before the next application. Seven weeks following the date of injury, the non-absorbable outer layer of BTM was removed and the fingertip was reconstructed using a full thickness skin graft harvested from the groin. Post operative review at 1 month showed complete graft take into the finger pulp. Nail growth was preserved as the nail bed germinal matrix was preserved. Overall, the finger tip has been reconstructed with no loss of length and with great aesthetic and functional outcome
Conclusions: The primary objectives of reconstructive surgery for fingertip injuries are to preserve the length of the finger, restore sensation, and achieve an acceptable aesthetic outcome. Fingertip amputations with significant soft tissue loss and extensive bone exposure of the distal phalanx can traditionally be managed with soft tissue reconstruction using flaps, with the aim of maintaining length, or shortening of the digit. Both surgical options lead to compromise of the functional and aesthetic aims of fingertip reconstruction. Additionally, they carry the issue of potentially longer operating times, altered sensation and donor site morbidity. Dermal matrices, such as BTM, provide an operatively simple yet effective reconstructive technique for fingertip amputations with maintenance of length, good aesthetic and functional outcomes. More specifically to BTM, its synthetic nature provides a reduced risk of infection useful in traumatic finger amputations where developing osteomyelitis risks further amputation. Furthermore, the layering of BTM allows a more aesthetic reconstruction of finger volume. Whilst the extended time for serial operations and BTM integration may not be acceptable for all patients, for those willing to comply we believe BTM provides a superior result.

A-0590 CHONDROBLASTOMA WITH SECONDARY ANEURYSMAL BONE CYST OF THE SCAPHOID: CASE REPORT

Marta Almenara, Isidro Gracia, Ana Peiró, Laura Trullols, Pau Machado, Claudia Lamas
Hospital de la Santa Creu i Sant Pau, Barcelona, Spain

Introduction: Chondroblastoma is a primary, benign and uncommon cartilaginous bone tumour that typically occuring in the epiphyses and apophyses of long bones, and accounts for 1-2% of all primary bone tumors. Chondroblastoma involving the carpal bones is a rare condition, and second aneurysmal bone cyst can be found in up to a third of chondroblastomas.
Aim: We present a case of recurrent scaphoid chondroblastoma with secondary aneurysmal bone cyst after initial curettage and bone grafting treated in our institution. Second surgery with a scaphoid resection and partial carpal arthrodesis with bone grafting was performed.
Material & Methods: An 18-year-old, left-handed man presented left wrist pain, with local tenderness, joint stiffness and reduced grip strenght. Radiographs and magnetic resonance imaging revealed and expansile, lytic and well-marginated lesion within the scaphoid, with erosion and thinning of the involved cortex suggestive of chondroblastoma. The tumor was treated initially with curettage, high-spreed burring and bone grafting.
Histollogic study confirmed the diagnosis of the chondroblastoma, with the combination of oval mononuclear cells , osteoclast-like giant cells with chondroid differentiation or calcification and thin walled blood vessels. Immunohistochemical study showed histone H3K36M positivity, which confirms the diagnosis of chondroblastoma.
At 6 months after surgery, the patient presented a local recurrence with carpal collapse, and he required a scaphoid resection and four-corner fusion wrist with a circular plate and autologous cancellous bone graft.
Results: At 12 months after surgery, the patient remains asymptomatic without pain and no signs of recurrence. The successive followup radiographs and magnetic resonance imaging show no residual alteration

Conclusions: Chondroblastoma involving the carpal bone is a rare condition, and can mimic other benign bone tumors. The presence of secondary aneurysmal bone cyst could increase the risk of local recurrence. Patients need to be followed postoperatively for the chance of tumor recurrence, which may cause pain and carpal destruction.

A-0591 15-YEARS EXPERIENCE IN RELEASING PSEUDOSYNDACTYLY IN RECESSIVE DYSTROPHIC EPIDERMOLYSIS BULLOSA: THE ENHANCING EFFECT OF MICROSURGICAL APPROACH AND A TAYLORED DERMAL REGENERATION TEMPLATE GLOVE

Aurelio Portincasa, Liberato Cecchino, Domenico Parisi, Fedele Lembo
University Department of Plastic and Reconstructive Surgery, Policlinic of Foggia, Foggia Medical School, Foggia, Italy

Introduction: Epidermolysis bullosa (EB) is a miscellaneous group of rare hereditary illnesses characterized by skin blistering triggered by minor trauma. Recessive dystrophic EB (RDEB), a prominent and common EB subtype, is distinguished by impaired wound healing, inflammatory dysbalance, and fibrotic alterations, as well as low to nonexistent collagen VII levels. Because of its exposed position and continuing usage in daily activities, the hand is continually at danger of microtrauma and is thus one of the organs most affected by the disease, resulting in extremely debilitating abnormalities that offer a challenge in hand surgical practice.
Material & Methods: The authors discuss their microsurgical experience in treating pseudosyndactylies of RDEB hands, comparing the traditional vaseline gauze dressing to an upgraded "glove protocol" using a Dermal Regeneration Template. Endpoints evaluated included healing times, hospital stay time, patient discomfort, free-recurrence interval, follow-up range, and major complications.
Results: A total of 38 surgeries were carried out on 26 RDEB patients with hand abnormalities. Compared to standard vaseline gauze dressing, the microsurgical approach associated with the use of dermal regeneration template tailored gloves resulted in a significant reduction in hospital stay, healing time, dressing pain and discomfort for the patients, as well as an increasing in recurrence-free interval.
Conclusions: The integrated simultaneous use of microsurgery and bioengineered Dermal Regeneration Template detailed in our study, has resulted in a consistent decreasing of complications rate, in successful long-term outcomes for our patients, showing several advantages and positive effects.
Further studies will be useful to widen up the number of treated patients with our protocol.

A-0592 TOTAL WRIST ARTHRODESIS IN PATIENTS WITH ADVANCED OSTEOARTHRITIS: CURRENT IMPLANTS AND OUTCOMES

Gregoire N. Chick[1,2,3]
[1]Hand & Wrist Unit, Genolier Campus, Vaud, Switzerland; [2]Orthopaedic Department, Joan & Sanford I. Weill Medical College, Cornell University, New York, NY, USA; [3]Orthopaedic Department, Ghent University, Ghent, Belgium

Total wrist arthrodesis can be used to treat symptomatic end-stage wrist osteoarthritis after failed conservative treatment. It can also be considered the last-resort option when partial fusion, proximal row carpectomy, denervation or prosthetic arthroplasty is unsuccessful.
Currently anatomic pre-contoured low-profile plates with angle stable screws are available with or without inclusion of the carpometacarpal joints.

Generally, patients are satisfied after total wrist arthrodesis, although they are not always pain-free, even when wrist flexion and extension remain limited or absent.
Complications and reoperations occur frequently, most often due to incomplete bone fusion or hardware-related problems. It is still not known which type of implant is best for degenerative osteoarthritis and if the carpometacarpal joint should be included in the arthrodesis.
Future prospective randomized trials may shed more insights on these questions.

A-0593 MIRROR HAND DISORDER'S SURGICAL MANAGEMENT WITH METACARPAL WEDGING

Zsombor Márton[1], Tamás Kassai[2], Aba Lőrincz[3], Gergő Józsa[3,4]
[1]Department of Anatomy, Medical School, University of Pécs, Pécs, Hungary; [2]Department of Pediatric Traumatology, Péterfy Hospital, Manninger Jenő National Trauma Center, Budapest, Hungary; [3]Department of Thermophysiology, Institute for Translational Medicine, Medical School, University of Pécs, Pécs, Hungary; [4]Division of Surgery, Traumatology, Urology, and Otorhinolaryngology, Department of Paediatrics, Clinical Complex, University of Pécs, Pécs, Hungary

Introduction: Ulnar dimelia, also known as "mirror hand disorder", is a rare developmental disorder affecting the upper limb. Primarily, it involves the duplication of fingers, carpal bones, metacarpals, or ulna along the sagittal axis, and is often accompanied by the absence of the radius or thumb. The anomaly presents challenges in both bone and soft tissue development, impacting limb functionality and affecting a child's quality of life.
Material & Methods: We present the case of a one-year-old girl with unilateral ulnar dimelia. Surgical intervention was considered to address functional and aesthetic concerns. The surgery involved creating an opposable thumb from preaxial fingers through a carefully tailored approach. Post-surgical therapy included physiotherapy and psychotherapy to ensure both physical functionality and psychological adjustment.
Results: The surgical procedure successfully provided an adequate grip pattern, and the patient demonstrated age-appropriate use of the modified hand at the six-month follow-up. Comparison with similar cases highlights the diversity in ulnar dimelia presentations and the need for customized surgical solutions.
Conclusions: The timing of surgery is typically recommended between one and two years, considering both anatomical readiness and the advantages of cerebral plasticity in young patients.

A-0594 THE FAMILY BURDEN OF CARPAL TUNNEL SYNDROME AND ULNAR NERVE ENTRAPMENT

Malin Zimmerman[1,2], Caroline Sevcik[1,3], Mattias Rydberg[1,3], Peter M Nilsson[4], Olle Melander[4,5], Lars B Dahlin[1,3,6]
[1]Department of Translational Medicine – Hand Surgery, Lund University, Skåne University Hospital, Malmö, Sweden; [2]Department of Orthopedics, Helsingborg Hospital, Helsingborg, Sweden; [3]Department of Hand Surgery, Lund University, Skåne University Hospital, Malmö, Sweden; [4]Department of Internal Medicine, Lund University, Skåne University Hospital, Malmö, Sweden; [5]Department of Clinical Sciences Malmö, Lund University, Malmö, Sweden; [6]Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden

Introduction: Even though carpal tunnel syndrome (CTS) is common, with a prevalence of around 5%, its complex pathogenesis remains incompletely understood. Ulnar nerve entrapment (UNE), less prevalent but also less understood, is the second most common peripheral nerve entrapment. In recent years, the genetic background of peripheral nerve entrapments has been highlighted, and several risk genes have been identified.
Aim: This study aimed to investigate whether having a first-degree relative with CTS is associated with an increased risk of developing CTS.

Material & Methods: Between 1991 and 1996, a cohort of 30,446 individuals aged 46 - 73 years were recruited to the Malmö Diet and Cancer Study (MDCS). The baseline investigation of participants included clinical assessment, laboratory analyses, and an extensive questionnaire regarding lifestyle habits, socioeconomic factors, medication, and illnesses. Data from index individuals of MDCS were combined with extensive data from their first-degree relatives (parents, children, and siblings) using the Multi-Generation Register, administered by Statistics Sweden, combined with data from national registries administered by the National Board of Health and Welfare. The Multi-Generation Register contains data on individuals born from 1932 onward who resided in Sweden at some point after 1961. CTS cases were identified through national registries using relevant ICD-codes.
Results: Of the included 30,446 individuals, 18,326/30,446 (60.2%) were female. Of the included individuals, 1,436 (4.7%) were diagnosed with CTS and 371 (1.2%) with UNE. Mean age at diagnosis was 66 (SD 12) years for CTS and 62 (SD 12) years for UNE. Having a first-degree relative with CTS was associated with a significantly higher frequency of CTS in the index individual, where 251/2,901 (8.7%) had CTS, compared to 1,185/27,545 (4.3%) among those without a family history (chi-square, $p < 0.001$). In UNE, 18/875 (2.1%) individuals with a first-degree relative with UNE had UNE compared to 353/29,571 (1.2%) in individuals without a first-degree relative with UNE ($p=0.028$).
In the logistic regression analysis, individuals with a first-degree relative affected by CTS were twice as likely to develop CTS themselves (OR = 2.08, 95% CI: 1.81–2.40), even after adjusting for sex. Individuals with a first-degree relative with UNE were almost twice as likely to develop UNE themselves (OR 1.75, 95% CI 1.08-2.82)
Conclusions: In a population-based study, data from a Multi-Generation Register show that having a first-degree relative with CTS or UNE doubles the risk of developing these disorders. The results add further knowledge about the causes of developing CTS and UNE and to previous data indicating a high degree of hereditability in CTS. It emphasizes the importance of considering family history in risk assessment and early intervention strategies.

A-0595 TITLE: ENHANCING AO CLASSIFICATION FOR DISTAL RADIUS FRACTURES: A THREE-DIMENSIONAL APPROACH THROUGH FRACTURE SEGMENTATION AND FRAGMENT NAME TAGGING

Andreas Verstreken[1,2,3], Frederik Verstreken[1,2,3,4], Jozef Michielsen[1,2,3], Matthias Vanhees[1,2,3,4]
[1]University of Antwerp, Medical and Healthcare Science, Belgium; [2]Antwerp Surgical Training, Anatomy and Research Centre (ASTARC) University of Antwerp, Wilrijk, Belgium; [3]Orthopedic Department, University Hospital Antwerp, Antwerp, Belgium; [4]Department of Orthopedic Surgery, AZ Monica, Antwerp, Belgium

Hypothesis: Implementing 3D segmentation and fragment name tagging into the AO classification for distal radius fractures will enhance its diagnostic value and provide valuable insights into optimal fixation techniques, thereby improving patient outcomes
Aim: This study aims to integrate a 3D fracture segmentation and tagging system into the AO classification for distal radius fractures to improve diagnostic clarity, inter- and intra-observer reliability, and clinical utility
Material & Methods: Fracture Tag System Integration with AO Classification
We began by incorporating an established fracture tag system (Verstreken et al.) into the AO classification. This tagging system allows each fracture fragment to be uniquely identified within the AO classification, enhancing clarity and communication regarding fracture patterns. This approach addresses potential ambiguities in fragment identification and establishes the groundwork for evaluating the 3D compatibility of the AO classification for distal radius fractures.
Database and Segmentation of Distal Radius Fractures
We utilized a database of 200 segmented distal radius fractures, creating detailed 3D visualizations of each fracture

pattern and fragment. Representative cases for each AO classification type were selected from this database to ensure a comprehensive analysis of fracture patterns and to assess the applicability of the name-tagging system.
Extension of AO Classification and Diagnostic Assessment
To evaluate the consistency and reliability of the AO classification with the integrated tagging system, a Qualtrics® questionnaire was distributed to resident orthopedic surgeons, orthopedic surgeons, and hand surgeons. The survey assesses inter- and intra-observer variability to identify strengths and limitations in naming and classifying fractures using this 3D approach.
Additionally, we have introduced subdivisions within the AO types 23C2 and 23C3, allowing for finer analysis of these complex patterns. These subdivisions facilitate correlations between surgical interventions and optimal clinical outcomes, providing enhanced guidance for treatment planning
Results: The inter- and intra-observer questionnaire is currently in progress. By gathering multiple perspectives on fracture characterization, we aim to understand the level of consensus in classification and to validate the reliability of our tagging system. This ongoing assessment will inform future refinements, ensuring practical applicability in clinical practice.
Preliminary classification includes distinguishing fractures based on radial shaft contact with the articular surface: fractures with contact are assigned code M0, and those without are coded as M1. For complex cases like 2R3C3.3 fractures, an additional middle (m) fragment is identified along with distal (d) and proximal (p) fragments, allowing comprehensive categorization.
Figure 1 demonstrates the application of the fracture tagging concept within the AO classification framework. This approach assigns a clear and unique code to each fracture fragment, enhancing both communication and processing accuracy in clinical and research settings.
1. Verstreken A, Michielsen J, Vanhees M. A proposal for name-tagging three-dimensional distal radial fracture fragments based on preliminary results. Journal of Hand Surgery (European Volume). 2024;0(0). doi:10.1177/17531934241265681

A-0596 FRACTURES OF THE DISTAL THIRD OF THE CLAVICLE – A CASE REPORT

César Correia[1], João Lucas[2], João Soeima[2], Fernando Macedo[2], Miguel Rocha[2], Ana Correia[3], Rui Matos[2], Patrícia Cunha[2], José Simães[2], Inês Henriques[2], Carlos Vilela[2], Marco Oliveira[2]
[1]Unidade Local de Saúde de Braga; [2]Unidade Local de Saúde do Alto Ave; [3]Unidade Local de Saúde de Santo António

Introduction: Fractures of the distal third of the clavicle are common orthopedic injuries, accounting for 10-25% of all clavicular fractures. They are often associated with direct trauma, such as falls onto the shoulder or traffic accidents.
The clavicles are part of the shoulder girdle, and fractures in this region can result in significant pain and dysfunction in shoulder range of motion.
Thus, it is imperative to implement the most appropriate treatment, whether conservative or surgical, depending on the fracture pattern, particularly the displacement and stability of the distal fragment determined by the integrity of the coracoclavicular ligaments, and the patient's functional demands.
Material & Methods: We present the case of a 39-year-old man admitted to the emergency department after a bicycle fall with trauma to the left shoulder.
Objectively, the patient had extensive abrasions and significant swelling of the left shoulder, along with pain on palpation of the left acromioclavicular region. He also presented slight functional limitation of the left shoulder due to pain, without evidence of neurovascular deficits.
Radiologically, a comminuted fracture of the distal third of the left clavicle (Neer classification V) was identified, and the left upper limb was placed in a sling for symptomatic relief.

The patient awaited appropriate skin conditions to undergo the proposed surgical intervention.
He underwent open reduction and internal fixation of the distal clavicle fracture with a locked distal clavicle plate and ligamentopexy using a double-button elastic system, performed under arthroscopic assistance.
Results: In the early postoperative period, the patient continued using a sling for pain relief.
At 15 days postoperatively, he reported mild pain and had a healed wound. Physical rehabilitation was initiated, and the sling was maintained for another 2 weeks.
At 2 months postoperatively, he showed good range of motion in the left shoulder, although muscle strength was reduced compared to the contralateral side.
At 5 months postoperatively, the patient resumed his previous professional activities and tasks, with full and symmetrical active shoulder mobility and full strength, despite mild pain during greater exertion. He was still undergoing occasional physiotherapy to maintain his range of motion.
At 9 months post-surgery, he reported a normal life without limitations, he showed no neurovascular deficits and demonstrated full active mobility and total strength without any pain for at least 2 months earlier
Conclusions: The treatment of distal third clavicle fractures require a careful and individualized approach, considering the severity of the fracture, the patient's age and comorbidities, and their functional demands.
Clinical and radiographic evaluation is essential to determine the most appropriate treatment.
Most patients can recover satisfactory shoulder function; however, complications such as infection, nonunion and joint stiffness may occur.

A-0597 TITEL: EVALUATING VOLUME AND SHAPE OF DORSAL ULNAR FRAGMENTS IN AO TYPE C3 DISTAL RADIUS FRACTURES: IMPLICATIONS FOR FIXATION STRATEGIES AND FRAGMENT-SCREW RELATIONSHIPS

Andreas Verstreken[1,2,3], Issam Benhamou[1], Frederik Verstreken[1,2,3,4], Jozef Michielsen[1,2,3], Matthias Vanhees[1,2,3,4]
[1]University of Antwerp, Medical and Healthcare Science, Belgium; [2]Antwerp Surgical Training, Anatomy and Research Centre (ASTARC) University of Antwerp, Wilrijk, Belgium; [3]Orthopedic Department, University Hospital Antwerp, Antwerp, Belgium; [4]Department of Orthopedic Surgery, AZ Monica, Antwerp, Belgium

Introduction: In comminuted distal radius fractures, specific fracture patterns are frequently observed. One common example is the AO Type C3 fracture, characterized by intra-articular comminution that is often multifragmentary dorsally. Achieving stable fixation with a volar plate can be challenging when there is an associated dorsal ulnar fragment (dDU) (Verstreken et al., Miyashima et al.). Specialized plate designs incorporating dorsal screws or K-wire fixation may be necessary for adequate stabilization (Sakamoto et al.) Understanding the volume and shape of the dDU fragment is essential for informed decision-making regarding internal fixation and hardware selection
Aim: This study aims to analyze the characteristics of distal dorsal ulnar (dDU) fragments in distal radius fractures within a population in Antwerp, Belgium. We focus on assessing the volume and shape of the dDU fragments and correlating these with the requirements for stable fixation using fixed-angle locking screws. Additionally, we investigate the feasibility of stabilizing these critical fracture fragments based on their unique morphological characteristics.
Materials & Methods: CT scans from 170 patients with distal radius fractures were included in this study. Patients under 18 years old, polytrauma patients, and those with a history of distal radius fractures were excluded. DICOM images from CT scans were converted to 3D models using Materialise software (Mimics software 26.0, Materialise, Leuven). All fractures were segmented, and individual fragments were isolated for analysis. Patients with intra-articular distal dorsal ulnar fragments were further examined. For each dDU fragment, the volume (mm^3) and shape were analyzed. A

locking screw was positioned centrally within the fragment, and the screw's volume was subtracted from the fragment to assess fit and fixation potential
Results: Analysis is ongoing
Conclusions: Conclusions will be provided upon completion of data analysis.

1. Verstreken A, Michielsen J, Vanhees M. A proposal for name-tagging three-dimensional distal radial fracture fragments based on preliminary results. Journal of Hand Surgery (European Volume). 2024;0(0). doi:10.1177/17531934241265681
2. Miyashima Y, Kaneshiro Y, Yano K, Teraura H, Sakanaka H, Uemura T. Size and stabilization of the dorsoulnar fragment in AO C3-type distal radius fractures. Injury. 2019;50(11):2004-2008. doi:10.1016/j.injury.2019.08.003
3. Sakamoto S, Doi K, Hattori Y, Al-Bazzaz A, Hayashi K, Sonezaki S. Comminuted Dorsal Ulnar Fragment in Distal Radius Fractures Treated Using the Integrated Compression Screw With a Mini-Plate. J Hand Surg Am. 2022;47(4):394.e1-394.e6. doi:10.1016/j.jhsa.2021.09.002

A-0598 COMPLEX APPROACH TO SURGICAL TREATMENT OF SPASTIC PARALYSIS IN UPPER EXTREMITY

Margarita Kateva, Kalin Angelov, Nikola Simeonov, Iliyana Marcheva, Elena Kandilarova
UMHAT Sofiamed, Hand Surgery and Reconstructive Surgery Department, Sofia, Bulgaria

Introduction: Surgery is crucial in terms of care of the spastic upper limb. Operative procedures for the spastic upper extremity aim to correct the common deformities of rotational contractures of shoulder joint, elbow flexion contracture, forearm pronation, wrist and finger flexion, ulnar deviation, and thumb-in-palm deformity. Different surgical techniques have been described to address each of the common deformities and underlying causes, including muscle spasticity, joint contracture, and paralysis. Partial selective neurectomy of motor nerves has been shown to decrease spasticity in the target muscles. This procedure can be combined also in clinical cases with more rigid deformity correction where soft tissue and bone surgeries are performed. In cases of spasticity-related joint deformities, joint release, arthrodesis, tendon lengthenings, tendon transfers, tendon rerouting and arthrodesis may be used. Main purpose of surgery in cases of upper limb spasticity is to get better function and posture of the affected upper limb so to result in improvement of daily activities and hygiene
Aim: To present combination of surgical techniques for treatment of complex cases with spastic paralysis in upper extremity.
Methods: The inclusion criteria of the patients in our series were spastic upper limb secondary to stroke, traumatic brain injury, and cerebral palsy. Recorded measurements were patient's age at surgery, gender, etiology of the spasticity, associated procedures during the selective neurotomy such as tendon transfer, tendon elongation and joint arthrodesis. The results were studied by passive and active range of movement in the affected joints; the first follow-up occurred between 1 and 6 months, and at the last follow up at around 12 months to study the durability of the results in 20 patients based on several criteria: spontaneous position, range of motion, muscle tone, spasticity according to functional evaluation (House scale)
Results: The results were collected as we recorded passive and active range of motion straight after surgery, two weeks post op and 1-6 months postoperatively as the early follow up. Passive range of motion restored first just in the days after surgery, active range of motion restored at least two weeks post op. At 12 months post op passive and active range of motion remains restored.
Conclusion: The management of spasticity is multidisciplinary and involves physical therapists, occupational therapists, physiatrists and surgeons. Surgical treatment plays big role in upper limb spasticity cases in the recent years. There are many available operative procedures such as selective neurectomy, tendon and bone surgeries, but every patient must

be approached by its individual features. All of our 20 cases, spasticity is reduced with improvements in the functional scores and these results are stable at the last follow up. But still further studies need to be done to evaluate late follow up at long terms post op.

A-0599 INTERPOSITION OF VASCULARIZED FASCIA INTO THE TRAPEZIAL RESECTION CAVITY FOR THE SURGICAL TREATMENT OF TRAPEZIOMETACARPAL OSTEOARTHRITIS

Simo Mattila, Eero Waris, Ville Haapamäki
Helsinki University Hospital, Helsinki, Finland

Backround: Trapeziometacarpal osteoarthritis has been treated with interposition of autologous fascia into the trapezial resection cavity to prevent scaphometacarpal impingement with suboptimal results. Autologous fascia may undergo necrosis and gradual shrinkage due to avascularity. We propose vascularization of the interposed fascia using microvascular techniques as a new alternative to achieve a durable graft with sufficient soft tissue volume.
Patients and methods: In this retrospective study, 11 surgeries for 8 patients (6 women, 2 men)(5 primary and 6 revision cases) were performed using vascularized fascial grafts from the anterolateral thigh for interposition in the trapezial resection cavity with microvascular anastomosis for revascularization. Subjective assessment included the short version of the Quick disabilities of the hand, shoulder and arm and patient related hand wrist evaluation scores. Objective assessment included strength and range of motion measurements. Radiographs were obtained preoperatively and at each follow-up visit. An MRI was done at a mean of 19 months postoperatively.
Results: The size of the harvested fascial grafts was 2 x 2-3 cm with a thickness of 1.5-2 cm. There were no postoperative complications apart from one seroma in the graft harvest site. The mean clinical and radiologic follow-up was 2 years and 8 months. The procedure provided pain relief PRWHE pain 32 (SD 13) - 9 (SD 12), $p<0.0001$, increased tip pinch strength 4kg (SD3) - 6kg (SD2), $p<0.05$, and improved overall function PRWHE 60 (SD28) - 16 (SD21), $p<0.0001$ and QuickDash 50 (SD21) - 13 (SD17), $p<0.0001$. Radiographs demonstrated maintenance of the scaphometacarpal space, while MRI scans showed the presence of mildly edematous interposed tissue within the resection cavity.
Conclusions: Although technically demanding, vascularized fascia presents an attractive alternative for the treatment of trapeziometacarpal osteoarthritis. It may be particularly advantageous in complex cases requiring revision surgery and in young patients with high functional demands.

A-0600 INTERCARPAL KINEMATICS AFTER OPEN SURGICAL TREATMENT FOR PERILUNATE INJURIES

Mathias Haefeli[1,2], Julia Felsbourg[2], Janina Riederer[3], Iwan Dobbe[2], Geert Streekstra[2,4]
[1]Kantonsspital Graubünden Chur, Switzerland; [2]Amsterdam UMC Amsterdam, The Netherlands; [3]Inselspital Bern, Switzerland; [4]Academic Medical Center Amsterdam, The Netherlands

Introduction: Perilunate dislocations and fracture dislocations lead to a disruption of multiple intrinsic and extrinsic ligaments of the wrist. The treatment of choice includes open or arthroscopically assisted reduction, temporary transfixation of the carpal joints with or without direct ligament repair and fracture fixation. With timely treatment and adequate restoration of carpal alignment, satisfying clinical outcomes can be achieved. Nonetheless, some restriction of range of motion (ROM) and grip strength can be expected. We hypothesize that studying intercarpal kinematics may be of added value to judge functional outcome. While there is some literature on intercarpal kinematic changes after scapho-lunate

injuries and scaphoid non-union, only little is known about carpal kinematics after treatment for these more complex wrist injuries.
Aim: To investigate intercarpal scaphoid and triquetrum motion in relation to the lunate and to compare this to the healthy wrist in patients after open surgical treatment for perilunate dislocations or trans-scaphoid perilunate fracture-dislocations.
Material & Methods: In this follow-up study 6 patients after perilunate dislocation (lesser arc) and 7 patients after trans-scaphoid perilunate fracture dislocations (greater arc) underwent a static 3D-CT and subsequent 4D-CT scan of the affected and the healthy wrist. While the wrist was 4D-CT scanned, they actively performed a guided E-F and R-U motion within 10 seconds in a specifically designed wrist guiding device. The difference in the radio-scaphoid and radio-lunate angles in neutral wrist position between affected and healthy side was measured from the 3D images. The smallest and largest distances between the scaphoid and lunate (SL-joint) and the lunate and the triquetrum (LT-joint) within the motion cycle were determined as a measure of joint stability. For comparison of the healthy and the affected side the Wilcoxon Signed Ranks Test was used.
Results: Mean follow-up after surgery was 94months (26-166). The difference in the radio-scaphoid and radio-lunate angles in neutral wrist position between affected and healthy side was 10.1° (2.9°-26.7°) and 8.2° (0.9°-25.2°). No statistically significant difference was found between lesser and greater arc group. Sagittal plane rotation of the scaphoid during E-F showed a similar pattern in the affected and healthy wrist whereas the differences for coronal and axial plane rotation were larger. Axial plane scaphoid translation during E-F showed only small differences while they were bigger in the sagittal and coronal plane. The motion patterns during R-U-deviation by trend showed larger differences than during E-F. The motion patterns of rotation and translation for the triquetrum was close to normal in most cases. The maximal SL-distance during E-F and R-U-deviation was larger in the affected side ($p=0.033$). No differences were found for the LT-distance and between lesser and greater arc groups.
Conclusions: The intercarpal motion pattern for the SL- and LT-joints was quite similar between the healthy and the affected wrists. This indicates good restoration of the intrinsic carpal ligaments even though the SL-joint showed some widening. Reduced ROM rather seems to be a problem of extrinsic and surgical approach-related scarring.

A-0601 SOONG GRADE AS A PREDICTOR OF PLATE REMOVAL AND FLEXOR TENDON ISSUES AFTER VOLAR PLATING

Cristobal Greene[1,2,3], Fernando Chagra[2], Lorena Parra[1,2,3], Aldo Villavicencio[1,4]
[1]Hospital DIPRECA, Chile; [2]Universidad Diego Portales, Chile; [3]Clinica MEDS, Chile; [4]Clinica INDISA, Chile

The Soong classification evaluates plate prominence in distal radius fractures and has been linked to potential flexor tendon injuries or tenosynovitis.
This retrospective review included 107 wrist fracture cases treated by three experienced hand surgeons. Soong classification was assessed alongside AO fracture classification and the type of plate used in surgery.
Results: The average patient age was 66 years. AO classification distribution was as follows: 85 type C fractures (C1: 6, C2: 28, C3: 51), 14 type A (A2: 3, A3: 11), and 8 type B (B2: 3, B3: 5). Based on Soong classification, 35 cases were type 0, 63 type 1, and 9 type 2.
Of the 107 cases, 54 were treated with plates designed for distal fractures, while the rest used standard plates. Plate removal occurred in 4 cases (3.7%), with 3 (2.8%) related to discomfort. One case (C3, Soong 2) involved early osteosynthesis failure, requiring revision with an external fixator and pins. The remaining 3 cases (C3 and C2, Soong 1) were due to synovitis. Only 1 of the 4 cases involved a plate designed for distal fractures; the rest used standard plates.
In the Soong 2 case, plate removal was due to material failure, not tendon issues. Tendon complications occurred only in Soong 1 cases, making a direct correlation between Soong classification and tendon problems unclear.

Follow-up (1-6 years) limits long-term analysis, as plate-related discomfort may emerge up to 7 years. However, complex fractures (C2, C3) were the only ones requiring hardware removal, particularly with standard plates.
Conclusion: The Soong classification did not show a clear association with tendon complications in this series. Plate removal was infrequent (3.7%) and mostly related to complex fractures and standard plates. Proper plate selection is critical in complex cases.

A-0603 ADDITIONAL SURGERY AFTER TRAPEZIECTOMY WITH LIGAMENT RECONSTRUCTION AND TENDON INTERPOSITION: AN 8 YEAR FOLLOW-UP OF 1369 PATIENTS

Cathelijne Daams[1], Niek J. Nieuwdorp[1], Cecile M. C. A. van Laarhoven[1,3], Lisa Hoogendam[1], Xander Smit[1,2], J. Michiel Zuidam[1], the Hand-Wrist Study Group, Caroline A. Hundepool[1,2]
[1]Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [2]Hand and Wrist Center, Xpert Clinics, The Netherlands; [3]Department of Plastic, Reconstructive and Hand Surgery, Jeroen Bosch Ziekenhuis, 's-Hertogenbosch, The Netherlands

Background: Trapeziectomy with Ligament Reconstruction and Tendon Interposition (LRTI) is a key treatment for thumb carpometacarpal (CMC-1) osteoarthritis (OA). Despite proven effectiveness, concerns remain about the need for revision surgery and its impact on long-term outcomes. Current literature lacks data on long-term rates of additional surgery.
Aim: This study evaluates long-term outcomes of trapeziectomy with LRTI in CMC-1 OA, focusing on revision rate.
Methods: This multicenter prospective cohort study included patients who underwent trapeziectomy with LRTI (Weilby-sling, Burton-Pellegrini, or APL-sling) for CMC-1 OA between December 2011 and October 2021. The primary outcome was the rate of additional surgery beyond one year following LRTI, classified in four different categories. Secondary outcomes included prognostic factors for revision surgery, and long-term patient-reported outcomes (PROMs). Additionally, the impact of revision surgery on PROMS was assessed.
Results: A total of 1369 patients were included, with a median follow-up of 7.8 years (range 3.1 to 13.0 years), of which 13% (95% Confidence Interval (CI): 11.3% to 14.9%) underwent additional surgery beyond one year. Revision surgery was required in 2.6% (95% CI: 1.7% to 3.5%). The APL-sling technique and younger age were associated with higher revision rates. PROMs improved significantly between 12 months and long-term follow-up, with revision surgery being associated with worse outcomes.
Conclusions: Long-term follow-up revealed a 13% additional surgery rate, with 2.6% requiring revision surgery. We advise against the APL-sling and suggest alternative treatments in younger patients to postpone LRTI-surgery and reduce the risk of revision.

A-0604 A NEW TECHNIQUE FOR THE TREATMENT OF SCAPHOID FRACTURES WITH BUTTERFLY FRAGMENT: FIXATION WITH HEADLESS COMPRESSION SCREW AND BUTTRESS PLATE

Ömer Faruk Kümbüloğlu
University of Health Sciences, Sisli Hamidiye Etfal Research and Training Hospital, Department of Hand Surgery, Istanbul, Turkey

Introduction: Although headless compression screws are commonly used in the surgical treatment of scaphoid fractures, the use of plates has recently become widespread. The primary indication for the utilisation of plates is the presence of comminuted fractures. However, the fact that the compression provided by the headless compression screw cannot be achieved with the plate raises concerns about the ability to achieve union with the use of the plate.

Aim: To describe the surgical treatment of a butterfly comminuted scaphoid fracture with a headless compression screw and buttress plate.
Materials and Methods: A 28-year-old male patient presented with right wrist pain following a fall from the stairs. On physical examination the wrist appeared deformed. There was severe wrist tenderness. Radiographs showed a transscaphoid perilunate fracture dislocation. Computed tomography scan showed a large butterfly fragment in the scaphoid fracture line. In surgery, following reduction of the lunocapitate joint, the scaphoid fracture was reduced and stabilised with a K-wire for placement of a headless compression screw. In this position, it was observed that stabilisation was achieved in the proximal and distal poles of the scaphoid, but not in the butterfly fragment. While the butterfly fragment was held in the reduced position with a clamp, the hole for the headless compression screw was drilled and a 3.5 mm headless compression screw was inserted. Subsequently, a mini plate was positioned on the scaphoid butterfly fragment in a buttress configuration and secured with a screw. No screw was placed in the butterfly fragment. All fragments demonstrated good stability. Two K-wires were used to stabilise the lunocapitate joint. The K-wires were removed at postoperative week 5 and the patient was referred to physiotherapy.
Results: At 3 months post-operatively, union of the scaphoid was observed by x-ray and computed tomography. At the 6-month follow-up, the patient had 70 degrees of active wrist flexion and 80 degrees of active wrist extension. The patient was pain free and returned to work after treatment.
Conclusions: In cases where a solitary butterfly fragment is present in a comminuted scaphoid fracture, subsequent studies may demonstrate that favourable outcomes can be achieved through the utilisation of a headless compression screw in conjunction with a buttress plate, employing the novel methodology that we have delineated.

A-0605 CHRONIC REJECTION OF A TRANSPLANTED HAND ENDING IN AMPUTATION AT THE PATIENT'S REQUEST

Ahmed Elsaftawy, Paweł Stajniak, Szymon Manasterski, Michał Chęciński, Piotr Węgrzyn, Maja Smorąg, Marta Jagosz, Jędrzej Króliński
Department of Plastic and Hand Surgery, St. Jadwiga Śląska Hospital in Trzebnica, Poland

Introduction: Vascularized composite allotransplantation (VCA) offers aesthetic and functional benefits for upper limb amputees but is limited by risks of chronic rejection, leading to pain, skin changes, and declining function. Emerging adjunct therapies, such as fat grafting with platelet-rich plasma (PRP), show promise for immune modulation and tissue repair.
Aim: This report underscores the complexities of managing chronic rejection and the vital role of patient autonomy in deciding treatment outcomes.
Material & Methods: This case report presents a former soldier with a right-hand transplant who, after initial functional success, developed chronic rejection. Multiple interventions, including neurolysis, flap coverage, and fat grafting with PRP, were attempted.
Histopathology was analyzed before and after fat grafting to assess lymphocyte infiltration and vascularity.
Results: Fat grafting with PRP yielded short-term benefits, reducing lymphocyte infiltration and improving skin texture. Despite this, the patient's pain and functional limitations persisted, leading him to choose reamputation.
Conclusions: While fat grafting with PRP shows potential for managing chronic rejection symptoms in VCA, it may not fully counteract rejection progression. This case underscores the importance of patient-centered care and autonomy in chronic VCA management, highlighting the need for further research into adjunctive treatments to improve quality of life and functional outcomes.

A-0606 DO PERSONALIZED TREATMENT GOALS CHANGE FOLLOWING A HAND SURGEON CONSULTATION? A PROSPECTIVE COHORT-STUDY

JR Rutten[1], JW Colaris[1,2], HP Slijper[1,4], RW Selles[1,2], NL Loos[1,2], Robbert M Wouters[1,2]

[1]Department of Rehabilitation Medicine, Erasmus MC, Rotterdam, The Netherlands; [2]Department of Plastic, Reconstructive, and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [3]Department of Orthopaedics and Sports Medicine, Erasmus MC, University Medical Centre Rotterdam; [4]Hand and Wrist Center, Xpert Clinics, Amsterdam, The Netherlands

Hypothesis/Background: As a hand surgeon, understanding a patient's treatment goals is important for effective shared decision-making. We introduced the Personal Meaningful Gain (PMG), which identifies individualized treatment goals by determining 1) in which domain a patient wants to improve (e.g., pain, activities, mobility, etc.) and 2) the improvement needed to achieve satisfaction with the treatment results. Previous research indicated that only 40% of patients obtain their PMG at 3 months post-treatment, which may partly be due to an unrealistic PMG (e.g., a too ambitious goal). In such cases, it could be useful if hand surgeons and patients collaboratively adjust the PMG to a more realistic PMG. This could increase the likelihood of obtaining the PMG and thus increase satisfaction with treatment results. However, it is unclear if the PMG changes following hand surgeon consultations.

Aim: We assessed changes in the PMG following hand surgeon consultation in a generic sample of patients with hand and wrist conditions. Second, we investigated factors associated with whether the PMG changed and identified the proportion of patients who achieved their treatment goal three months post-treatment.

Material/Methods: This prospective cohort study included adult patients with thumb base osteoarthritis, carpal tunnel syndrome, trigger finger, de Quervain's tenosynovitis, TFCC lesions, and Dupuytren's contracture who completed the PMG before and after hand surgeon consultation. Data were collected at Xpert Clinics between October 2021 and November 2023. The patient first chooses a domain he/she most wants to improve with treatment (e.g., pain, activities, tingling, etc.). Then, the PMG is calculated as the difference between the baseline score on that domain (range 0-10) and the score the patient wants to achieve to be satisfied with the treatment results. We evaluated changes in the PMG using t-tests, quantified the changes in the self-chosen most important domain, used logistic regression to identify factors associated with whether the PMG changed, and identified how many patients obtained their PMG.

Results: We included 1093 patients, of whom 191 (17.5%) changed their PMG after hand surgeon consultation (mean change: 0.14 [95% CI 0.08 to 0.21], Cohen's d=0.07 [-0.02 to 0.15], $p<0.001$). 176 (16.1%) patients changed their most important domain, most commonly moving away from appearance (27.3%), work (23.5%), or activities (20.5%). Of these patients, the majority moved to strength (45.8%), numbness (21.7%), or flexibility/mobility (12.6%). Higher age was associated with a greater likelihood of changing the PMG (standardized odds ratio: 1.43 [1.09 to 1.89], $p=0.01$). At 3-month follow-up, 38.6% of patients obtained their treatment goal.

Conclusion: We found only minor changes in the PMG following a hand surgeon consultation. As a relatively large group (61.4%) did not achieve their PMG at three months, more patients may hypothetically benefit from adjusting their PMG. This implies that hand surgeons may not actively encourage patients to adjust their PMG when needed. Therefore, more actively targeting treatment goals during consultations is recommended to improve shared decision-making and satisfaction with treatment results.

A-0607 OUR MAJOR REPLANTATION EXPERIENCE

Osman Samil Sevindik, Yasin Canbaz, Oguzhan Tekin, Furkan Uysal, Percin Karakol
İstanbul Basaksehir Cam and Sakura City Hospital ,Plastic,Reconstructive and Aesthetic Surgery Department,İstanbul,Turkey

Introduction: Replantations at the level of the radiocarpal joint and above, such as wrist, forearm, transhumeral, foot or shoulder, are referred to as major replantations. Despite advances in microsurgery, there are no clear guidelines for deciding between stump repair and replantation in proximal amputations. Patients with realistic expectations and preserved limb function may be candidates for replantation.
Aim: This report presents four major replantation cases treated at our clinic, highlighting challenges encountered and solutions applied.
Material & Methods: While hand and finger replantation are common, those above the wrist remain rare, with no definitive indications. Success in major replantations relies on a structured approach, considering the patient's condition, injury severity, ischemia time, and the type of injury. Major amputations severely affect a patient's quality of life and require long, complex surgeries, repeated interventions, and an extended recovery. Therefore, the decision to proceed should be made by an experienced surgeon with access to a skilled medical team, including emergency, ICU, anesthesia, and physical therapy specialists. The four male patients, with an average age of 33, presented with crush injuries resulting in amputations. The types of amputation were: high-level humeral amputation (patient 1), mid-forearm amputation (patient 2), and ankle-level amputation (patients 3 and 4). The Mangled Extremity Severity Score (MESS) was used to assess limb salvage potential. The MESS scores were 8, 6, 7, and 5, respectively.
Results: In patient1, sural vein graft was used to bridge a gap in the brachial artery, while in the others, primary closure was performed under a microscope without grafts. In cases involving foot and forearm amputations, orthopedic involvement allowed for bone shortening and fixation, enabling primary repair of neurovascular structures without the need for grafts, except in patient1. Circulation in the amputated limbs remained stable in all patients, and they were closely monitored in the ICU.
However, patient1 developed complications after surgery, including deteriorating renal and vital function due to the severity of the crush injury. Despite stable circulation in the amputated limb, the patient's condition worsened, and a decision for amputation was made. In another case, after observing muscle edema and limited circulation in the amputated foot, the patient chose amputation, which was performed with stump closure. The other two patients, one with forearm replantation and one with an ankle amputation, maintained stable circulation and were transferred to the ward for rehabilitation and physical therapy.
Conclusions: Although microsurgery and replantation techniques have advanced, major limb replantation remains a challenging process. Successful outcomes depend on careful patient selection, thorough monitoring, and the ability to make swift decisions if vital functions are compromised. Replantation decisions should be approached cautiously to ensure the patient's safety and minimize risk.

A-0609 UNSTABLE ACROMIOCLAVICULAR DISLOCATIONS – A CASE REPORT

César Correia[1], João Lucas[2], João Soeima[2], Fernando Macedo[2], Miguel Rocha[2], Ana Correia[3], Rui Matos[2], Patrícia Cunha[2], Inês Henriques[2], José Simães[2], Carlos Vilela[2], Marco Oliveira[2]
[1]Unidade Local de Saúde de Braga; [2]Unidade Local de Saúde do Alto Ave; [3]Unidade Local de Saúde de Santo António

Introduction: Acromioclavicular dislocations are common injuries, accounting for approximately 9% of shoulder girdle injuries, predominantly affecting male athletes. They are frequently caused by direct trauma to the shoulder or a fall onto it.

The diagnosis is primarily radiographic, and treatment depends on the patient's functional activity, the degree of displacement, and the extent of ligament involvement.
Within this spectrum of injuries, Rockwood grade V acromioclavicular dislocation involves complete rupture of the acromioclavicular and coracoclavicular ligaments, resulting in significant elevation of the clavicle relative to the acromion. Compared to lower-grade injuries, it is less common but presents greater complexity and a higher potential for joint instability.
Material & Methods: We report the case of a 34-year-old male heavy vehicle driver with a history of depression and lumbosacral arthrodesis, admitted to the emergency department after a motorcycle accident with trauma to the right shoulder. He presented with deformity, a "piano key" sign, swelling, and painful functional limitation of the right shoulder. Radiographic evaluation revealed a right acromioclavicular dislocation (grade V in Rockwood's classification). A sling was applied, and surgery was proposed.
The patient underwent reinsertion of the acromioclavicular ligaments with anchors and coracoclavicular ligament fixation using a double-button elastic system, performed under arthroscopic guidance.
Results: In the early postoperative period, the patient showed good pain control and proper healing of the surgical wound, with no neurovascular compromise. A sling was recommended, along with avoidance of efforts with the operated limb. At 4 weeks postoperatively, he reported no significant pain, with healed wounds and no neurovascular deficits. Physiotherapy was initiated.
At 3 months postoperatively, the patient had no pain or functional limitations and showed a full range of motion with complete and painless strength.
At 7 months postoperatively, he had returned to his professional activity (driver-operator) but was limited to driving without lifting heavy loads.
At 9 months post-surgery, he displayed no sensory-motor changes, total and symmetrical active shoulder mobility with full strength. He reported sporadic episodes of mild right shoulder pain and continued occasional physiotherapy sessions for rehabilitation and maintenance of strength and range of motion
Conclusions: Grade V acromioclavicular dislocations are severe orthopedic conditions that require appropriate therapeutic management to restore shoulder stability and function.
Surgical treatment, particularly ligament reconstruction using grafts and/or internal fixation, is essential for effectively addressing these injuries. Success is closely tied to an intensive postoperative rehabilitation program to recover range of motion and ensure the return to daily, professional, and sports activities without significant limitations.
A precise diagnosis and early intervention are crucial to optimize functional outcomes and minimize long-term complications.

A-0610 ASSESSMENT OF THE EXTENSIBILITY OF THE REVERSE METACARPAL BONE FLAP BASED ON THE DORSAL METACARPAL ARTERY IN PHALANGEAL BONE RECONSTRUCTION: CADAVERIC ANATOMICAL STUDY AND FLAP STANDARDIZATION

F. Paganini[1], C.M. Fra[2], A. Crosio[3], L.Valdatta[1], F. Tamborini[1]
[1]Circolo Hospital and Macchi Foundation, Insubria University, Varese (Italy); [2]UOC Chirurgia della Mano Borgo Trento, AOUI Verona (Italy); [3]UOC Ortopedia e Traumatologia 2, Chirurgia della Mano e Microchirurgia Ricostruttiva Ortopedica, AOU Città della Salute e della Scienza, Turin, Italy

Context: The reconstruction of phalangeal bone defects represents a significant clinical challenge, often requiring innovative surgical solutions. The reverse metacarpal bone flap, based on the dorsal metacarpal artery (bDMCAr), is a

commonly utilized technique in reconstructive surgery. However, the feasibility and potential extension of the pedicled bDMCAr flap for distal phalangeal bone reconstruction remain subjects of interest. This cadaveric anatomical study aims to investigate the flap's potential to extend the reconstructible distance for phalangeal bone defects and its applicability in phalangeal reconstruction.

Materials and Methods: Thirteen fresh cadaveric upper limbs were dissected to expose the dorsal metacarpal artery and relevant phalangeal structures.

The procedure included:

1. Flap preparation: A standard bDMCAr flap was raised, preserving the periosteum covering the proximal diaphyseal portion of the metacarpal bone.
2. Flap extension: A controlled, gradual extension of the flap was performed to assess its ability to cover and reconstruct a bone defect at the phalangeal level.

The extended bDMCAr flap was positioned over simulated defects to evaluate its capacity for adequate reconstruction and support for bone regeneration.

Results: The findings demonstrated that defects of the first phalanx of each finger could be reconstructed without causing tension on the vascular pedicle. An extended version of the flap, utilizing the communicating arterioles between the dorsal and volar circulation at the commissural level beyond the metacarpal heads (Bakhach modification), was also studied. This modification allowed the flap to reach, without vascular pedicle tension, defects in the distal phalanges or proximal phalanges of adjacent fingers near the reference commissure.

Conclusions: This study explored the extension potential and reconstructive applications of the bDMCAr flap. The modified approach, incorporating distal commissural communicating arteries, confirmed its efficacy as a viable reconstructive alternative for phalangeal bone defects.

A-0611 ARTHROSCOPIC EVALUATION OF KIENBÖCK'S DISEASE; A PROSPECTIVE STUDY ON 28 PATIENTS IN A REFERRAL CENTER IN IRAN

Mohammad Ali Okhovatpour, Meisam Jafari Kafiabadi, Mesbah Rasti, Reza Shahryar Kamrani

[1]Taleghani Hospital , Shahid Beheshti University of Medical sciences, Tehran, Iran; [2]Shohada Tajrish Hospital, Shahid Beheshti University of Medical sciences, Tehran, Iran; [3]Taleghani Hospital , Shahid Beheshti University of Medical sciences, Tehran, Iran; [4]Dr. Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

Introduction: Kienböck disease is defined as the avascular necrosis of the lunate bone and is associated with limited wrist extension for patients. Lichtman classification is usually used for the classification of this disease; however, it may be associated with some limitations, and joint details cannot be shown by this method.

Aim: In this study, the arthroscopic assessment was conducted in Kienböck patients to find the best classification method for this disease.

Material & Methods: This prospective study was conducted on 28 Kienböck patients referred to Taleghani Hospital from 2018 to 2020. The arthroscopic assessment was conducted in patients based on the standard technique. Modified Outerbridge classification was used for the classification of the cartilage damage and Lichtman classification was used for radiological assessment of Kienböck disease.

Results: Eighteen patients (64.3%) were male and the mean age of patients was 30.5 ± 8.57. For Lichtman classification, one patient was in grade 1 (3.6%), five patients (17.9%) were in grade 2, seven patients were (25%) in grade 3A, 12 patients were (42.9%) in grade 3B and three patients (10.6%) were in grade 4. Distal radius and proximal lunate joints were the

most common injured joints in patients (89.3%) followed by distal lunate joints (75%). A positive association was observed between the Lichtman classification and the number of injured joints ($r = 0.445$, P-value = 0.006)
Conclusions: Proximal lunate is the most common site of injury in Kienböck disease and the progression of the disease is usually from proximal to distal; however, due to vascular variation, distal lunate involvement can be seen without proximal involvement in these patients.

A-0612 FINGERTIP AMPUTATIONS USING ADIPOSE FLAP AND SKIN GRAFT WITH LIPOFILLING

Gabriel Badida, Bohumil Zálešák
Department of Plastic and Aesthetic Surgery, University Hospital Olomouc, Czech Republic

Background: Fingertip amputations pose a significant challenge in reconstructive surgery due to the diversity of injury patterns and the lack of consensus on standard treatment protocols. This article introduces a novel approach using an adipose flap for reconstructing fingertip defects with bone exposure, highlighting its advantages in preserving the pulp area without causing donor site morbidity or disabling scars.
Material and Methods: This study included seven patients with volar oblique or transverse fingertip defects measuring no larger than 3 cm, operated on under local anesthesia. Outcomes were assessed over a 12-month follow-up period, focusing on healing time, aesthetic and functional recovery, and patient satisfaction.
Results: The mean healing time was approximately three weeks, with no flap failures observed. Functional recovery was assessed using the static two-point discrimination (2-PD) test, with an average score of 7 mm. Nail deformities occurred in two cases, but no significant infections or complications were reported. Lipofilling was performed in five cases to address distal fingertip volume loss.
Conclusion: The proposed technique is highly reliable and cost-effective, offering a single-stage procedure that maintains fingertip length and nail bed integrity while avoiding scars in the pulp region.

A-0613 MOTOR RECOVERY OF ACUTE ULNAR NERVE INJURIES AT THE DISTAL THIRD OF FOREARM: EFFECTIVENESS OF ANTERIOR INTEROSSEOUS TO ULNAR MOTOR SUPERCHARGE NERVE TRANSFER

F. Paganini, S. Matarazzo, A. Brandolini, B. Corsini, L. Fresta, E. Mascherpa, A. Minini, J. Teodori, L. Valdatta, A. Fagetti
Circolo Hospital and Macchi Foundation, Insubria University, Varese, Italy

Background: Distal ulnar nerve injuries at the forearm represent debilitating conditions for patients, often resulting in loss of intrinsic hand muscle function and corresponding sensory deficits. Various approaches to addressing these injuries have been proposed in the literature. This study reports on 11 cases of anterior interosseous nerve (AIN) supercharge to the ulnar nerve in acute injuries.
Materials and Methods: From January 2022 to January 2023, 11 AIN supercharge procedures to the ulnar nerve were performed in patients with complex upper limb trauma within 72 hours of injury. These patients had undergone sural nerve grafts for nerve gaps ranging from 3 to 6 cm. Follow-up evaluations assessed sensory recovery using the two-point discrimination test, motor recovery, and the resumption of daily activities through validated questionnaires (QuickDASH).
Results: All cases achieved good sensory recovery, with a mean two-point discrimination test score of 7 mm. Motor recovery showed satisfactory results, with patients resuming daily activities within three months post-surgery and no claw hand deformities observed. Recovery outcomes and timeframes were superior to those reported in the literature for ulnar nerve injuries treated with neurorrhaphy alone.

Conclusions: AIN supercharge to the ulnar nerve demonstrated faster recovery times compared to the literature and treatment with neurorrhaphy alone. No functional deficits related to the use of the AIN were observed. The intrinsic hand muscle function and trophism were maintained satisfactorily, supporting compatibility with daily life activities at the two-year follow-up.

A-0614 TREATMENT OF RECURRENT PSEUDARTHROSIS OF FOREARM WITH BONE GRAFT AND FREE MEDIAL FEMORAL CONDYLE FLAP: PROSPECTIVE SINGLE-CENTRE STUDY

F. Paganini, S. Matarazzo, A. Brandolini, B. Corsini, E. Mascherpa, A. Minini, S. E. Robbiati, J. Teodori, L. Valdatta, A. Fagetti
Circolo Hospital and Macchi Foundation – Insubria University – Varese (Italy)

Background: Recurrent forearm nonunions are a debilitating and often multifactorial complication. This study aims to evaluate the effectiveness of combining auto- or allografts with medial femoral condyle free flap wrapping in the treatment of forearm nonunions following failed previous interventions.
Materials and Methods: A prospective single-center study was conducted, including patients treated for forearm nonunion between January 2021 and June 2024. Inclusion criteria required radiographic diagnosis of nonunion with persistent clinical symptoms, unresponsive to conservative treatments, and at least one prior surgical attempt. All patients underwent surgical bone grafting of the distal radius (in one case, cadaveric graft) combined with concurrent wrapping using a medial femoral condyle free flap. Postoperative follow-ups were conducted at 1, 3, 6, and 12 months, assessing bone consolidation through radiographic imaging and wrist functionality using clinical evaluation scales such as the Disabilities of the Arm, Shoulder, and Hand (DASH) score.
Results: Nine patients were included in the study. Complete healing of the nonunion was achieved in all cases. No major complications were reported, including at the donor site. Bone healing was confirmed radiographically at six months. Average DASH scores significantly improved from a preoperative mean of 55±10 to 15±5 at the 12-month follow-up, indicating substantial functional recovery
Conclusions: The combination of bone grafting and medial femoral condyle free flap wrapping proved highly effective in resolving forearm nonunions. This approach represents a reliable option for managing complex nonunions, providing patients with a dependable solution to restore wrist and forearm functionality.

A-0615 PROXIMO-DISTAL ARTHRODESIS AS A PRIMARY INTERVENTION FOR SEVERE FIFTH FINGER DUPUYTREN'S CONTRACTURE: A SAFE, EFFECTIVE, AND HIGH-SATISFACTION TREATMENT STRATEGY

Caro Roten, Stien Hoskens, Kira Vande Voorde, Bert Vanmierlo, Arne Decramer
AZ Delta vzw, Roeselare, Belgium

Introduction: Severe recurrent Dupuytren contracture of the fifth finger is a challenging clinical condition. Various treatment modalities have been proposed: external fixation, local skin flap, dermofasciectomy, or even amputation. An alternative surgical technique was introduced by Honecker et al. in 2016 and refined by Raimbeau et al. in 2019, consisting of resection of the middle phalanx and shortening arthrodesis. By combining proximo-distal interphalangeal arthrodesis with a limited fasciectomy through a volar approach, finger extension improved, and fixed abduction was also treated.
Aim: This study investigates the outcomes of proximo-distal interphalangeal arthrodesis of the little finger as a first-line procedure in stage III and IV Dupuytren's contractures to minimize complications and optimize hand function.

Material & Methods: Thirteen patients with severe, non-operated Dupuytren's disease (Tubiana stage III/IV) affecting the fifth finger were treated using a combination of proximo-distal interphalangeal arthrodesis and limited fasciectomy. The follow-up period was 1 year. MCP joint range of motion (ROM) and grip strength were assessed pre-and postoperatively. Quick DASH and VAS scores were assessed pre- and post-operatively to determine overall patient satisfaction and pain respectively. Radiographic evaluation was made at 6 and 12 weeks and 1 year postoperatively. Complications and recurrence were documented.
Results: The average age of patients was 67 years (range 43-78). The mean radiographic consolidation time was 75 days (range 41-171). Full extension was achieved in in all but seven patients, with four patients showing a residual 10° extension lag, and three presenting greater extension deficits. Average MCP joint flexion reached 95° (range 94-102). VAS scores were low (range 0-2) and patients reported high satisfaction. Minor complications were observed, with swelling being the most common. None of the patients suffered from neurologic or vascular complications.
Conclusions: Primary proximo-distal interphalangeal arthrodesis with limited fasciectomy offers a safe and effective treatment modality for managing severe PIP joint contracture in Dupuytren's disease. The procedure yields high patient satisfaction and functional outcomes. Further long-term investigation is needed to determine recurrence rates and long-term functional outcomes.

A-0616 RECONSTRUCTION OF THE FLACCID ARM WITH TENDON TRANSFERS AFTER TBPP

Yasin Canbaz[1], Ali Can Aydin[2], Muhammed Yasin Babacan[1], Okyar Altas[3], Zeki Celik[1], Percin Karakol[1]
[1]Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, İstanbul Türkiye. [2]Batman ER State Hospital, Batman Türkiye. [3]Basaksehir Cam and Sakura City Hospital, Hand Surgery Department, İstanbul Türkiye

Introduction: Traumatic brachial plexus palsy (TBPP) is characterized by varying degrees of upper extremity paralysis due to traction, compression, or crushing injuries. Treatment modalities include proximal nerve exploration and repair, distal nerve transfers near target muscles, and biomechanical restoration through tendon transfers or functional free muscle transfers.
Objective: This report presents the case of a 21-year-old female patient with a right brachial plexus injury following a traffic accident. Despite nerve transfer procedures performed at another clinic, the patient failed to achieve functional recovery and was referred to our clinic for further evaluation and treatment.
Materials and Methods: The patient was involved in a traffic accident in 2021, resulting in C5-6-7-8 root avulsion. The first surgeries performed in 2022 at another clinic included lower trunk and T1 root decompression, spinal accessory nerve (SAN) transfer to the long head of the triceps for elbow extension, and Oberlin transfer (ulnar nerve motor branch and musculocutaneous nerve branch) for elbow flexion. However, at evaluation 15 months after surgery, the patient showed no active elbow flexion or extension and had significant shoulder instability. There was no hand and wrist extension, resulting in wrist drop, but finger flexion, opposition, and wrist flexion were intact. The right arm lacked active abduction, flexion, or extension and was perceived as "flaccid" due to uncontrolled swinging.
To restore elbow extension and shoulder stability, the middle trapezius muscle was transferred to the triceps insertion using a tensor fascia lata (TFL) tendon graft. In the second stage, Steindler flexorplasty was performed to restore elbow flexion by separating the medial epicondyle along with the flexor-pronator muscle origin and repositioning it anteriorly on the humerus. Before the third stage, the patient wore a static wrist splint for four months to assess functional recovery. This was followed by wrist arthrodesis to correct the drop hand.

Findings and Discussion: No early postoperative complications were observed. After the first surgery, slight active elbow extension was achieved and the shoulder joint became stable, eliminating the need for shoulder arthrodesis. The trapezius-triceps tendon transfer had a positive effect on the patient's morale, which had decreased due to the failure of previous nerve transfers. This success encouraged progression to subsequent surgeries.
After the second stage, the patient achieved approximately 90 degrees of elbow flexion, which enabled him to lift light objects with a static wrist splint. Following the third surgery, including wrist arthrodesis, the patient was able to effectively perform daily activities using his right upper extremity. The staged surgical approach and the patient's increased confidence in the treatment contributed to the overall success.
Conclusion: This case demonstrates that although nerve transfers are the current preferred strategy for the management of TBPP, tendon transfers remain a valuable alternative in select cases. Furthermore, restoring elbow extension before flexion may be a feasible approach depending on the patient.

A-0617 POSTEROMEDIAL OSTEOCHONDROMA OF THE PROXIMAL HUMERUS – A CASE REPORT

César Correia[1], Ana Correia[2], João Lucas[3], Fernando Macedo[3], Miguel Rocha[3], Rui Matos[3], Patrícia Cunha[3], João Soeima[3], Inês Henriques[3], José Simães[3], Carlos Vilela[3], Ana Batista[3]
[1]Unidade Local de Saúde de Braga, Portugal; [2]Unidade Local de Saúde de Santo António, Portugal; [3]Unidade Local de Saúde do Alto Ave, Portugal

Introduction: Osteochondromas are the most common benign bone tumors, usually diagnosed incidentally during childhood and adolescence, as they grow alongside skeletal maturation. They are characterized by cartilaginous exostosis that, depending on location and size, can cause mechanical or compressive symptoms. Typically asymptomatic, they may result in pain or neurological symptoms if they compress adjacent structures. Magnetic resonance imaging (MRI) is a key diagnostic tool that allows detailed assessment of these lesions, their extent, and their relationship with anatomical structures.
Material & Methods: We present the case of a 16-year-old girl with no relevant medical history, reporting persistent left shoulder pain associated with paresthesias in the left hand, with no history of falls or trauma onto that shoulder.
On physical examination, she exhibited tenderness upon palpation of the left shoulder, hypoesthesia, and paresthesias in the left hand, but no motor deficits.
MRI identified a sessile osteochondroma at the left third proximal humerus, measuring 4x3 cm, without contrast enhancement.
The lesion showed no signs of malignancy but was closely associated with her pain and dysesthesia, prompting a marginal excision of the osteochondroma. During surgery, an iatrogenic injury to a cutaneous nerve branch occurred, which was immediately repaired with neurorrhaphy.
Results: The histopathological analysis confirmed the diagnosis of osteochondroma.
In the early postoperative period, the patient had no significant complaints.
At 4 weeks postoperatively, she exhibited full mobility of the left shoulder, good scar healing, and no evident neurovascular deficits, reporting only mild dysesthesias on the lateral aspect of the shoulder, with no functional impact.
At 4 months post-surgery, she reported a prolonged pain-free period without daily life limitations. However, she noted a new mild shoulder pain about one week earlier, without traumatic or other context, and no local inflammatory signs or neurovascular deficits. Examination revealed tenderness over the proximal deltoid, and radiographic imaging showed no new lesions. She was advised to avoid efforts and use analgesics as needed.

Upon reevaluation two weeks later, as the symptoms persisted, an MRI was ordered for follow-up imaging.
At 7 months postoperatively, she no longer reported spontaneous pain, although mild tenderness over the previous lesion site persisted. She demonstrated full mobility and strength without neurovascular deficits and stated normal activities without limitations. MRI showed no lesion progression or complications. She continued to be monitored in outpatient follow-up
Conclusions: Osteochondromas are benign lesions and typically occult and asymptomatic that follow the skeletal maturation growth. Occasionally, it can cause significant symptoms when compressing adjacent structures such as nerves and tendons. MRI is essential for detailed lesion characterization and surgical planning.
Complete excision of the tumor is crucial for symptom relief and complication prevention, generally with good prognosis for patients' quality of life, although not without potential risks.

A-0618 PROGRESSION OF DUPUYTREN'S CONTRACTURE: SECONDARY ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL COMPARING SURGERY, NEEDLE FASCIOTOMY, AND COLLAGENASE INJECTION

Venla-Linnea Karjalainen[1], Janne Soikkeli[2], Mikko Räisänen[1,3], Olli V Leppänen[4], Aleksi Reito[5], Susanna Stjernberg-Salmela[6], Rachelle Buchbinder[7], Teemu Karjalainen[8]
[1]Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland; [2]Department of Hand surgery and Orthopedics, Oulu University Hospital, Oulu, Finland; [3]Department of Orthopedics, Traumatology and Hand Surgery, Kuopio University Hospital, Kuopio, Finland; [4]Department of Hand surgery and Microsurgery, Tampere University Hospital, Tampere, Finland; [5]Department of Orthopedics, Tampere University Hospital, Tampere, Finland; [6]Department of Musculosceletal and Plastic Surgery, Helsinki University Hospital, Helsinki, Finland; [7]School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia; [8]Department of Surgery, Hospital Nova of Central Finland, Jyväskylä, Finland

Introduction: Extension deficits caused by Dupuytren's contracture can be corrected by releasing the contracture either surgically, through needle fasciotomy, or by collagenase injection. Unlike cutting the cord percutaneously with a needle or collagenase, surgical removal of the cord might protect adjacent fingers from disease progression. On the other hand, the broader tissue trauma caused by surgery could also activate the disease in nearby fingers.
Aim: The aim of this study was to compare the progression of Dupuytren's contracture in patients receiving these three treatments during a two-year follow-up.
Material & Methods: In this finger-level analysis, we utilized data from the DupuytrEn Treatment EffeCtiveness randomized controlled Trial (DETECT), which included 302 patients who received treatment for 423 fingers overall. Progression was defined as an increase in the contracture angle of a finger between the three-month and two-year follow-up points and was analyzed in the treated fingers as well as the untreated and adjacent to treated fingers. Additionally, we used a linear regression model to investigate risk factors associated with disease progression and the need for retreatment in treated fingers in order to identify patients at the highest risk of recurrence.
Results: Of the study participants, 281/302 (93%) participated in the three-month angle measurements, and 274/302 (91%) participated in the two-year measurements. The results showed that in treated fingers, surgical treatment provided a more permanent outcome and reduced progression and the need for retreatments compared to needle fasciotomy and collagenase injection. No significant differences in progression were observed in untreated or adjacent to treated fingers between the treatment groups. Younger age at the time of treatment, smoking, and involvement of the little finger were associated with a higher risk of disease progression in treated fingers.
Conclusions: Surgery reduces recurrence in treated fingers but does not affect the need for treatment in other fingers.

Surgery offers the greatest benefits in reducing retreatments in high-risk patients, particularly those who are younger, smoke, or have a contracture in the little finger.

A-0619 8-YEAR FUNCTIONAL AND RADIOGRAPHIC FOLLOW-UP AFTER OPERATIVE TREATMENT OF SCAPHOID NONUNION

Morten Kjær, Robert Gvozdenovic
Department of Orthopedic Surgery, Hand Surgery Unit, Herlev-Gentofte University Hospital of Copenhagen, Denmark

Introduction: A scaphoid fracture account 2/3 of carpal bone injuries. The risk of developing scaphoid nonunion is 5-25%. Risk factors are delayed treatment, displacement, proximal pole fracture, tobacco users and advancing age.
Untreated up to 100% develop degenerative changes, scaphoid nonunion advanced collapse (SNAC). This usually results in decreased range of motion, grip strength and wrist pain.
Long term consequences of untreated scaphoid nonunion are well established, but there is sparse data on the long-term outcomes of operatively treated patients.
Aim: We hypothesized that operative treatment for scaphoid nonunion preserves the wrist joint with limited development of osteoarthrosis and reestablish good wrist function. Further, the implication of malunion in functional and patient reported outcomes was investigated
Material & Methods: An institutional search identified 150 patients between 2007-2018. All patients were invited for a clinical follow up, measuring range of motion, grip strength, key pinch, complications, Q-Dash, satisfaction and secondary surgery. A CT scan was made measuring scaphoid union, angulation (dorsal cortical angle and height to length ratio) and Prescence of degenerative changes.
Results are reported with means and SD or median with IQR. Difference in functional outcome, pain and patient reported outcome was tested with multiple linear regression. Significance level was $p<0.05$.
Results: 90 patients, 79/11 male with a mean follow up on 8.9 years participated in a clinical follow up. Q-dash was reported with a median of 5 (IQR 0,9.5). VAS at rest was mean 0.2 (range 0-5) vs. 2 (range 0.8) during activity.Grip strength (40kg vs. 45kg), key pinch (8.6kg vs. 8.9kg) and active range of motion (150° vs. 175°) were slightly reduced to the uninjured wrist. 91 % had no sign of osteoarthrosis before intervention vs. 72 % at follow up. The mean Height to length ratio and dorsal cortical angle was 0.65 (SD=0.2), and 94.8° (SD=13.5)
In patients with Height to length ratio >0.7, median Q-Dash was 9 (IQR 7-18) with mean VAS during activity on 3 (SD=2.6) vs. Q-Dash on 2 (IQR 0-7) and VAS 1.2 (SD=1.9) in patients with HLR <0.7. Range of motion was decreased in patients with malunion (HLR>0.7) compared to patients with no malunion.
Complication-rate of 14 % (4, superficial wound infection, 7/8 patients with self limited parasthesia)
Secondary surgery in 8.5 % (9 APSI prosthesis, 2 Neurectomy, 1 RSL-desis, 1 radius styloidectomy.
12 had removal of compression screw
Conclusions: Patients with union of the scaphoid have low occurrence of osteoarthritis with excellent wrist function and few clinical symptoms at the long term. The complication rate was exceptional low, hence the retrospective design. Patients with malunion had significant decreased range of motion and patient reported outcome seem, but with minor clinical relevance.

A-0620 THE RELATIONSHIP BETWEEN KINESIOPHOBIA, PAIN BELIEFS, COPING STRATEGIES AND FUNCTION IN TRAPEZIOMETACARPAL OSTEOARTHRITIS: QUESTIONS OF CAUSE AND EFFECT

Tugba Ulusoy[1], Cigdem Ayhan Kuru[1], Merve Sumeyye Yılmaz[1], Akın Uzumcugil[2]

[1]Faculty of Physiotherapy and Rehabilitation, Department of Orthopedic Physiotherapy and Rehabilitation, Hacettepe University, Ankara, Turkey; [2]Faculty of Medicine, Department of Orthopedics and Traumatology, Hacettepe University, Ankara, Turkey

Introduction: Trapeziometacarpal osteoarthritis (TMC OA) represents one of the most prevalent and painful manifestations of hand osteoarthritis, frequently resulting in chronic pain. In patients experiencing pain, kinesiophobia—defined as movement avoidance due to fear of (re)injury or pain—is a common phenomenon. Pain expression is influenced by multiple factors, including age, gender, emotional state, experienced pain, racial and cultural differences, and beliefs. Among these, pain beliefs are fundamental components of an individual's thought system, characterized as observable, testable, and modifiable hypotheses. Pain beliefs encompass two primary concepts: organic and psychological beliefs. Organic beliefs stem from the perception that pain originates from physical injury or bodily damage, with individuals associating greater injury with increased pain intensity. Conversely, psychological beliefs suggest that factors such as anxiety and depression influence pain origin. Research indicates that treatment processes and coping methods vary according to individual beliefs, necessitating the evaluation of both organic and psychological components simultaneously. Pain coping strategies exhibit considerable variation, particularly among individuals with chronic pain conditions. Studies have shown that chronic pain patients demonstrate higher levels of self-management and conscious cognitive intervention. Osteoarthritis (OA) patients, specifically, tend to employ self-management techniques alongside medical remedy interventions more frequently. These coping strategies show individual variability and appear to be modulated by pain beliefs. The high prevalence of anxiety and depression in the OA population (approximately 20%) is noteworthy, as these comorbidities can adversely affect pain experience in hand OA, potentially influencing pain beliefs and coping strategies while predisposing patients to kinesiophobia. Despite extensive research on pain severity and disability in TMC OA, psychosocial factors remain understudied in this population.

Aim: This study investigates the effect of fear of movement on pain beliefs, pain coping strategies, and function in patients with trapeziometacarpal osteoarthritis.

Material & Methods: In this cross-sectional study, forty-eight individuals with TMC OA (age: 62.21±10.24 years; BMI: 29.01±5.49 kg/m2) were evaluated using the Tampa Kinesiophobia Scale (TKS), Quick-DASH, Thumb Disability Examination (TDX), Hospital Anxiety Depression Scale (HADS), Pain Beliefs Questionnaire (PBQ), and Pain Coping Questionnaire (PCQ). Based on the established TKS threshold score of 37, participants were divided into low kinesiophobia (<37) and high kinesiophobia (≥37) groups. Mann-Whitney U test was used to compare differences between the two groups, with statistical significance set at $p<0.05$.

Results: Of the 48 patients 27 showed high kinesiophobia. These patients demonstrated significantly higher disability levels (Quick-DASH: $p=0.002$; TDX: $p=0.004$) and psychological beliefs ($p=0.003$), while showing no difference in organic beliefs. Pain coping strategies remained consistent between groups ($p>0.05$). Higher anxiety levels were observed in the high kinesiophobia group ($p=0.033$).

Conclusions: The findings demonstrate that high kinesiophobia significantly impacts upper extremity and thumb disability levels, psychological pain beliefs, and anxiety in TMC OA patients. This relationship appears bidirectional: kinesiophobia may trigger functional limitations and psychological changes, or disability combined with psychosocial factors may lead to kinesiophobia. Clinical practice should incorporate kinesiophobia assessment, with rehabilitation programs emphasizing multidisciplinary pain management through cognitive-behavioral interventions, including distraction and relaxation techniques, to effectively influence patients' beliefs and coping methods.

A-0621 ATTAINING A SURGICAL HAND FELLOWSHIP IN THE UK, A POST-RESIDENCY GUIDE

Efrat Daglan[1], Avi Adam Cohen[2], Layalee Abo Naser[3], Partick Goon[1]
1Hand unit, Plastic surgery department, East and north Hertfordshire NHS trust, Lister Hospital, Stevenage, UK; 2Plastic department, Shamir Medical Center (Assaf Harofeh), Be'er Ya'akov, Israel; 3 Hand surgery unit, Orthopedic department, Hadassah University Medical Center, Jerusalem, Israel

Introduction: For many novice experts across most surgical fields, undergoing fellowship training to further hone their skills in a particular sub-section of their vocation is paramount for their career to come.
Many such training venues are scarce given the relatively small workload of a particular sub-specialty, often limiting such units to select tertiary centers worldwide. The UK's world leading experts who provide care for a large and diverse population across many hospitals both general and specialized - thus have many surgical training programs that offer wide clinical exposure and comprehensive training that any aspiring surgeon would benefit greatly from
In this paper we will address how to navigate the difficult journey toward achieving a hand fellowship at the UK.
Learning Objectives: In this article, the authors review the steps needed to attain a UK fellowship, including ascertaining which hospitals offer fellowship programs, siphoning relevant open positions and navigation the myriad of paperwork while maximizing likelihood of proceeding to an interview.
Furthermore, the authors glance on preparing for interviews with emphasis on key issues for UK practice and appropriation.
Finally, we review several tips to effectively complete registration procedures and visa application - upon being accepted for a training position.
Summery: upon reading this, one should be better able to find relevant training programs, be more familiar with the nature of said programs and the process of applying to those most relevant, as well as be able to prepare effectively for interviews and the subsequent registration and visa application procedures.
The authors believe this paper will be suitable for the YEHS session since it is referring to doctors still in training.

A-0622 RESULTS OF TREATMENT FOR INTRA-ARTICULAR FRACTURES OF THE PROXIMAL INTERPHALANGEAL JOINT TREATED WITH THE SUZUKI TRACTION DEVICE

Miłosz Andrzejewski, Robert Rokicki
Clinic of Hand Surgery, Medical University of Lodz, Poland

Introduction: Intra-articular fractures of the proximal interphalangeal (PIP) joint, once healed, frequently result in limited joint mobility and often in complete joint stiffness, leading to significant impairment in hand function. One approach offering a chance to preserve joint mobility while achieving fracture union with proper alignment of fragments and maintaining the finger axis is the use of the Suzuki traction device. This device exerts traction on the fracture fragments and stabilizes the fracture, while allowing active finger movement during the healing process. The method also requires good patient cooperation and active participation in the treatment.
Aim: Results of Treatment for Intra-articular Fractures of the Proximal Interphalangeal Joint Treated with the Suzuki Traction Device
Material & Methods: A comprehensive evaluation of treatment outcomes for intra-articular fractures of the PIP joint was conducted in 24 patients treated at the Clinic of Hand Surgery, Medical University of Lodz, between 2016 and 2023. The following parameters were assessed in the operated patients: the range of motion of the PIP joint after treatment (using the Total Active Motion – TAM index), hand grip strength, quality of life (via the DASH questionnaire), and complications during and after treatment.

Results: The cohort included 5 women and 19 men. The youngest patient was 21 years old, the oldest was 68, with a mean age of 47 years. The most common fractures affected the 4th finger (42%), and the least frequent fractures occurred in the 5th finger (12%).
A satisfactory range of active motion (good or very good in the TAM scale) was achieved in 46% of patients.
PIP joint stiffness was observed in 5 patients, representing 21% of the cohort.
The procedure resulted in good hand function in 87% of patients (as per the DASH scale), facilitating their ability to perform activities of daily living. Muscle strength post-treatment was not significantly weaker compared to the healthy hand in 37% of patients.
The following complications were recorded: PIP joint stiffness in 5 patients, restricted joint mobility in 13 patients, degenerative changes in the joint in 11 patients, persistent swelling in 9 patients, pain from the presence of wires in 7 patients, and skin infection around the wires in 2 patients.
Conclusions: The results of treating intra-articular fractures of the PIP joint with the Suzuki traction device indicate that it is an effective method for treating these complex fractures in most patients. However, complications were noted in a subset of patients.

A-0623 THE ROLE OF PATIENT'S PSICOLOGICAL TRAITS IN NEUROPATHIC PAIN AFTER FINGER AMPUTATION: A RETROSPECTIVE CROSS SECTIONAL STUDY

Alessandro Crosio[1], Pierpaolo Caputo[2], Luca Monticelli[1], Monica Cicirello[1], Giulia Colzani[1], Davide Ciclamini[3], Paolo Titolo[1], Bruno Battiston[1]
[1]Hand Surgery Department, CTO, Torino, Italy; [2]Hand Surgery, Ospedale Pellegrini, Napoli, Italy; [3]Department of Health Sciences, Eastern Piedmont Universisty, Novara, Italy

Introduction: Neuropathic pain and cold intolerance is a widespread problem in patients who have undergone finger amputation, often associated with collateral nerve injury. Many factors are related to this problem: patient characteristics and type of trauma. It is known that neuropathic pain can be associated with long-term injuries and, in some cases, can be corticalised due to biological mechanisms. In addition, an association with non-organic elements has been established. In order to strengthen this topic, this retrospective study was carried out to investigate the association between the Big Five psicological trait and neuropathic pain after finger amputation.
Aim: Primary outcome: association between psychological trait described by BFI-10 scale and neuropathic pain and cold intolerance in finger amputation.
Secondary outcome: association between time since trauma, psychiatric disorder, type of nerve procedure and neuropathic pain and cold intolerance in finger amputations.
Material and Methods: Cross-sectional retrospective study including patients treated for finger amputation between 2021 and 2023 in a single trauma centre. Patients included had at least 1 year of follow-up. The presence of neuropathic pain was defined by a DN4 score greater than or equal to 4. Cold intolerance was defined by a CISS score greater than or equal to 30. Personality traits were assessed using the Italian version of the BFI-10 questionnaire. Demographic characteristics as well as time between trauma and amputation, type of trauma, surgical procedures on nerves were also recorded. Association was performed by linear regression analysis, chi-squared and odds ratio using SPSS software
Results: Approximately 90 patients were identified, 30 were lost, 54 were included. The patients were assessed directly. Statistical analysis showed a strong and significant correlation between the psychological trait defined as "neuroticism" and DN4 and CISS. Extroversion was also associated with DN4, but to a lesser extent and without statistical significance.

A strong association was found between time since trauma and treatment and DN4. Chi-squared test also showed an association between infection and necrosis as a cause of amputation and neuropathic pain. Psychiatric disorders prior to surgery were also strongly associated with high levels of neuropathic pain. Type of nerve surgery didn't show any association with DN4 and CISS

Conclusions: This retrospective study demonstrated an association between psychiatric disorder and neuropathic pain and cold intolerance after finger amputation. This is the first time that non-organic factors have been associated with neuropathic pain. It is also clear that delaying amputation increases the risk of neuropathic pain. In addition, amputation due to infection or prolonged necrosis of the distal segment increases the risk of neuropathic pain. Our conclusions should suggest that patients should be referred to a psychological service to identify psychological risk factors for more frequent follow-up. Furthermore, amputation should not be delayed in the presence of infection or prolonged necrosis. A prospective study should be carried out to determine whether nerve surgery is superior to other procedures in the prevention of neuropathic pain.

A-0624 ULTRASOUND GUIDED PERCUTANEOUS RELEASE OF A1 PULLEY: A RANDOMISED CONTROL TRIAL COMPARING TWO DIFFERENT TECHNIQUES

Cristina Lloret Peiró, Júlia Bargalló Granero, Miguel Nuño Pérez, Matías de Albert de Delas-Vigo, Irene Gallardo Calero, Ignacio Esteban Feliu

Hospital Universitari Vall d'Hebron, Barcelona, Spain

Introduction: Trigger finger is one of the most common causes for disability of the hand. When conservative treatment has failed, release of A1 pulley is indicated. Open release is currently the most used approach for this procedure.

However, the development of new percutaneous techniques that show good results may change the present paradigm. Multiple tools have been used in literature, being needles and hook knife the most frequent ones. The use of ultrasonography is not constant but has shown better results in terms of safety.

Aim: The aim of the present study is to determine the efficacy and security profile, as well as functional outcomes, of two different ultrasound-guided percutaneous techniques (using a needle or a hook knife) for the treatment of trigger finger.

Material & Methods: We present a randomised control trial performed in a single Spanish hospital from January 2024 to October 2024. Follow-up appointments were established at weeks 1, 2 and months 1, 3 and 6.

Two study groups were defined based on the instrument used for A1 pulley release: hypodermic 20G needle (NR) or hook knife (KR) (Kemis K1, Newclip). Patients were allocated in clusters to each of the groups. In both cases, the release was ultrasound guided. Needle group release was performed by a musculoskeletal interventional radiology specialist and knife group by a hand surgeon.

Descriptive data was collected. Failure of the procedure was considered as need for another surgery. Functional outcomes were assessed through Quick DASH questionnaire and range of movement (ROM) evaluation. Major and minor complications were documented during the follow-up visits. We also recorded data relative to painkillers requirements, time to resume daily activities and satisfaction.

Results: 60 patients were included in the study (30 NR and 30 KR). Mean age was 63,6±11 years and 65% of the patients were women. Mean basal Q-DASH score was 43±18.5%.

A second surgery was needed in 5 cases in NR group (16.6%) and one in KR (3.3%), but no statistical significance was found ($p = 0.085$).

There were no differences between groups in functional outcomes. All the patients who did not relapse presented

with full ROM at the end of the study. Q-DASH improved significantly in every follow-up evaluation, but there were no differences between groups. Mean Q-DASH at the end of the study was 8.16±16.1%. Patients in the KR group required fewer painkillers ($p = 0.1$).

There were no major complications. The most frequent complications were: painless nodule in entry point (8) and transient synovitis (11), complications were less frequent in KR group (p=0,1), but no statistical significance was obtained. Conclusions: Our results show no statistical differences in success rate, safety and functional outcomes when comparing US guided A1 pulley release with needle or hook knife; nevertheless, hook knife tends to present less failures, complications, and painkiller requirements.

The most frequent complications were: painless nodule at the entry point and transient synovitis.

Safety and success results in this study are consistent with previous literature

The use of needle or hook knife for this procedure should be left to surgeon preference, based on our results.

A-0625 SHORT-TERM RESULTS AFTER PATIENT-SPECIFIC LUNATE REPLACEMENT WITH PERILUNATE LIGAMENT RECONSTRUCTION

Mathias Haefeli[1,2], Joris Oonk[2], Iwan Dobbe[2], Geert Streekstra[2,3], Philipp Honigmann[2,4,5]

[1]Kantonsspital Graubünden Chur, Switzerland; [2]Amsterdam UMC Amsterdam, The Netherlands; [3]Academic Medical Center Amsterdam, The Netherlands; [4]Handzentrum Pratteln, Switzerland; [5]Swiss MAM Basel, Switzerland

Introduction: Persistent instability with carpal collapse, implant dislocation and non-anatomical implant design prevented lunate prostheses to become a standard treatment for Kienböck's disease. However, as younger and active patients are often affected, an as anatomical and functional reconstruction as possible would be desirable in order to prevent or delay salvage surgery. Our cadaveric experiments with patient-specific lunate prostheses and perilunate ligament reconstruction have shown good restoration of carpal kinematics. On this basis we implemented this procedure in clinic.

Aim: To report the short-term clinical and radiological outcome of the first patients treated for Kienbock's disease with a patient-specific lunate prosthesis and perilunate ligament reconstruction.

Material & Methods: We operated on 2 female (27/55y) and 2 male patients (25/52y) with symptomatic stage 3C Kienböck's disease and one female patient (22y) in stage 3B. A patient-specific lunate prosthesis, based on the opposite healthy lunate, was inserted. The FCR tendon and FiberTape® were used to reconstruct the dorsal scapho-lunate, palmar luno-triquetral and long radio-lunate ligaments in order to restore the functional unit of the proximal carpal row and to stabilize the prosthesis. Standard radiographs, range of motion (ROM), strength and PROM's according to ICHOM standards were recorded preoperatively, after 3 and after 12 months. At the time of the congress, we expect to be able to present the 24-month data of the first 2, 18-month data of the second 2 and 12-month data of the fifth patient.

Results: At abstract submission, patients 1&2 had 18 months, 3&4 12 and patient 5 8 months follow-up. No implant dislocations occurred. Sagittal rotation remained unchanged from intraoperatively in 3 cases. One patient showed a slight DISI development of 10°, one a slight increase in VISI from 7° to 14°. Three patients showed slight widening of the SL-interval 6 weeks postoperatively, which remained stable thereafter. The ulnar translation index remained unchanged, carpal height was slightly improved in 2 and maintained in 3 cases compared to preoperatively. At latest follow-up, preoperative E/F was improved by 17% (8%-33%) and R/U by 28% (0%-60%) to 59% (52%-64%) E/F and 63% (45%-73%) R/U of the opposite side. Grip strength increased by 41% (22%-55%) to 71% (46%-90%) of the opposite side. The PRWE score decreased from 59.25 (32.5-88.5) preoperatively to 27.25 (4-55.5). Pain at rest decreased from 1.75 (1-5) to 0.25 (0-1), pain on exertion from 7.5 (3-10) to 3.75 (1-9). 1 patient was extremely, 3 very, and 1 somewhat satisfied. All would recommend the surgery to others.

Conclusions: The initial short-term results are promising. Progression of carpal collapse and ulnar translation were prevented. ROM and strength were comparable to reported results of PRC and excel those of partial arthrodesis. Through more physiologic kinematics and biomechanics, we hope to achieve good long-term function and fewer degenerative changes, which often occur after PRC. This might delay or even prevent the need for salvage surgery. Patient selection and meticulous surgical technique are crucial, and the carpal collapse must not be very advanced as this cannot be reversed reliably.

A-0626 ARTHROSCOPIC SCAPHOTRAPEZIOTRAPEZOID JOINT FUSION FOR OSTEOARTHRITIS

Jan Myllykoski[1], Mikko Räisänen[2], Tero Kotkansalo[3], Matti Juntunen[2]
Markus Pääkkönen[1]
[1]Department of Hand Surgery, Division of Diseases of the Musculoskeletal System, Turku University Hospital, and CoE TYKS ORTO, Turku, Finland; [2]Department of Orthopedics, Traumatology and Hand Surgery, Kuopio University Hospital, Kuopio, Finland; [3]Pihlajalinna Hospital, Turku, Finland

Introduction: Arthroscopic scaphotrapeziotrapezoid (STT) fusion (ASTTF) has emerged in the recent decade as an option for traditional open surgery This retrospective study describes our technique and results of ASTTF.
Aim: The aim of the study is to determine whether STT fusion can be feasibly performed arthroscopically, and whether the results are comparable to, or possibly superior to, those of the open procedure.
Material & Methods: Medical records and radiological data of patient who had undergone ASTTF between 201 and 2022 in two tertiary hospitals were reviewed
Results: Five ASTTF in four patients were identified. The mean age of the patients was 52 years Fusion was achieved in four out of five wrists (80%) The mean postoperative radio-scaphoid angle was 8°, grip 32 kg (70% compared to contralateral hand), extension 5° (85%) and flexion 5° (93%) The mean follow-up time was 18 months (range 5 months to years) One wrist (20%) developed STT non-union requiring a reoperation 2 years after index surgery. The mean operative time was 153 minutes.
Conclusions: ASTTF is a technically demanding procedure with a steep learning curve and extended operative time. Despite these challenges, ASTTF is less invasive than the open procedure, with outcomes comparable to those reported for open techniques in the literature. Further prospective, randomized studies are necessary to evaluate the benefits and outcomes of ASTTF versus open methods. Additionally, advancements in the ASTTF technique are essential to improve efficiency and cost-effectiveness, making it a viable alternative to the open approach.

A-0627 THE EFFECTS OF METACARPOPHALANGEAL HYPEREXTENSION IN PATIENTS WITH TRAPEZIOMETACARPAL OSTEOARTHRITIS: WHICH THUMBS ARE IN TROUBLE?

Tugba Ulusoy[1], Cigdem Ayhan Kuru[1], Merve Sumeyye Yılmaz[1], Akın Uzumcugil[2], Ilhami Kuru[3]
[1]Faculty of Physiotherapy and Rehabilitation, Department of Orthopedic Physiotherapy and Rehabilitation, Hacettepe University, Ankara, Turkey; [2]Faculty of Medicine, Department of Orthopedics and Traumatology, Hacettepe University, Ankara, Turkey; [3]Faculty of Medicine, Department of Orthopedics and Traumatology, Baskent University, Ankara, Turkey

Introduction: Trapeziometacarpal joint osteoarthritis (TMC OA) affects around 25% of the adult population and causes pain and functional limitations. Hyperextension of the metacarpophalangeal (MCP) joint, a common but understudied consequence of TMC OA, can result from adductor pollicis contracture, fascial retraction, fibrosis, and MCP stiffness.

These factors contribute to progressive deformity of the thumb, with instability of the trapeziometacarpal joint leading to a 'zigzag' deformity pattern. Pinching activities that generate 1 kg at the fingertip in people with TMC OA increase compression load in the TMC joint to 12 kg. Due to inefficient interphalangeal flexion, force is transmitted to the metacarpal head rather than the distal phalanx tip. Despite conflicting evidence on the clinical effects, treatment of dynamic MCP hyperextension is recommended when pinching or hyperextension exceeds 20°. Understanding the relationship between MCP hyperextension and functional outcomes is critical to the development of effective rehabilitation strategies.
Aim: To investigate the effect of metacarpophalangeal joint hyperextension on physical function and disability in individuals with trapeziometacarpal osteoarthritis.
Material & Methods: This cross-sectional study included forty-eight TMC OA patients (age: 62.21±10.24 years; BMI: 29.01±5.49 kg/m2). Assessments included ROM measurements of trapeziometacarpal flexion/abduction, metacarpophalangeal flexion/extension) using goniometry, strength measurements (grip strength using the JAMAR dynamometer, lateral pinch strength using the JAMAR pinchmeter) and disability assessments (Quick-DASH, TDX). Participants were categorized into three groups based on MCP hyperextension: no hyperextension, 0º-20º hyperextension and ≥20º hyperextension. ANOVA was used for the group comparisons.
Results: The study compared 21 patients without hyperextension, 19 with 0º-20º hyperextension, and 8 with ≥20º hyperextension. TMC abduction ROM was significantly reduced in patients with ≥20º hyperextension (p=0.038). While grip strength showed no between-group differences, lateral pinch strength was decreased in the 0º-20º hyperextension group (p=0.028). TDX scores were higher in patients with 0º-20º hyperextension (p=0.022), though Quick-DASH scores showed no significant differences.
Conclusions: The results show that MCP hyperextension of ≥20º correlates with decreased TMC abduction ROM, while hyperextension of 0º-20º is associated with decreased lateral pinch strength and increased thumb disability. These results suggest that MCP hyperextension significantly impairs force distribution during lateral pinch and potentially accelerates the progression of OA. While increased MCP hyperextension initially suggests a greater decrease in pinch strength, the development of compensatory mechanisms, likely involving adjustments in thumb alignment and muscle activation patterns, could help mitigate the potential loss of pinch strength. Early detection and treatment of MCP hyperextension should be a priority in rehabilitation programs to prevent the development of a zigzag deformity. Future research should investigate the effectiveness of targeted interventions addressing MCP hyperextension on functional outcomes.

A-0628 GIANT PAROSTEAL LIPOMA – A CASE REPORT

César Correia[1], João Lucas[2], João Soeima[2], Fernando Macedo[2], Miguel Rocha[2], Ana Correia[3], Rui Matos[2], Patrícia Cunha[2], José Simães[2], Inês Henriques[2], Tiago Barbosa, Carlos Vilela[2], Paulo Vasconcelos[2]
[1]Unidade Local de Saúde de Braga; [2]Unidade Local de Saúde do Alto Ave; [3]Unidade Local de Saúde de Santo António

Introduction: Lipomas are benign tumors of adipose tissue that typically present as slow-growing subcutaneous masses. They are usually asymptomatic and often discovered incidentally.
Rare variants can cause significant symptoms due to their size and location. Among these are parosteal lipomas, which develop adjacent to bones, often within the periosteal tissue. These can cause symptoms by compressing or displacing surrounding anatomical structures.
Parosteal lipomas pose diagnostic and therapeutic challenges due to their proximity to bony and neurovascular structures. Magnetic resonance imaging (MRI) is the imaging modality of choice for evaluating these lesions, providing detailed information about their composition, extent, and relationship with surrounding structures. Accurate identification and

proper surgical planning are crucial to avoiding functional complications and ensuring a favorable prognosis.
Material & Methods: We report the case of a 49-year-old woman with a history of obesity who presented with a prominent, slow-growing swelling in the left arm. She reported no pain or sensory-motor changes.
MRI revealed a lipomatous tumor measuring 11 cm in its largest axis in the medial compartment of the left arm. The lesion had a regular contour, a homogeneously adipose texture, and appeared encapsulated. It was located posteriorly in the intermuscular planes, without muscle invasion. It displaced the axillary vascular bundle, biceps, and coracobrachialis anteriorly, and the long head of the triceps posteriorly, while contacting the radial nerve laterally. Posteriorly, the lesion abutted the humeral diaphysis and periosteum, with a peri-centimetric calcification noted.
A presumptive diagnosis of parosteal lipoma was established, and the patient underwent surgical resection of the lipomatous lesion and the periosteal calcification.
Results: Postoperatively, the patient experienced favorable clinical evolution without short- or medium-term neurovascular deficits and no signs of lesion recurrence.
At 4 weeks postoperatively, the patient exhibited a healed scar with no local inflammatory signs. She reported a return to normal life, having resumed her professional activities and usual tasks, with no pain or sensory-motor complaints. Objectively, she had full and symmetrical active mobility and total strength.
At 11 months postoperatively, the patient remained pain-free and without limitations in daily life. Clinically, she was doing well, with full mobility and strength and no clinical evidence of lesion recurrence
Conclusions: Although rare, parosteal lipomas should be considered in the differential diagnosis of painless limb masses due to their potential to cause significant symptoms through compression or displacement of adjacent structures.
Their close relationship with bones and neurovascular elements requires a meticulous diagnostic and therapeutic approach, therefore MRI is essential for characterizing these lesions and planning surgical treatment, safeguarding precise assessment and minimizing risks.
Complete excision of the tumor, including calcified components, is crucial for relieving symptoms, preventing complications and achieving excellent functional outcomes.
With proper management, the prognosis for patients with parosteal lipomas is highly favorable, allowing a return to normal activities and a good quality of life.

A-0629 ANALYSIS OF DUPUYTREN'S CONTRACTURE RISK FACTORS BASED ON NATIONWIDE RANDOMISED CONTROLLED TRIAL'S COHORT

Mikko Räisänen[1,2], Janne Johannes Soikkeli[3], Aleksi Rafael Reito[4]
[1]Department of Orthopedics, Traumatology and Hand surgery, Kuopio University Hospital, Kuopio, Finland; [2]Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland; [3]Department of Hand surgery and Orthopedics, Oulu University Hospital, Oulu, Finland; [4]Division of Musculoskeletal Diseases, Tampere University Hospital, Tampere, Finland

Introduction: Dupuytren's contracture (DC) is a chronic disease affecting the palmar fascia of the hand, with a mostly unknown etiology. The cause is likely complex and multifactorial. The strongest evidence points to genetic factors, but hypertension, hypercholesterolemia, coronary artery disease, diabetes, epilepsy, HIV infection, smoking, high alcohol consumption, and blue-collar worker employment have also been proposed as risk factors. Most of these possible risk factors, excluding genetic factors, lack adequate evidence and are based on small sample size studies.
Aim: The aim of this study was to investigate whether previously reported non-genetic DC risk factors are more represented in the Dupuytren Treatment Effectiveness Trial's (DETECT) RCT cohort compared to the general population, and to provide more evidence for or against their status as risk factors for DC.

Material & Methods: Our study's sample size included 302 DC patients from the DETECT trial. Associations with DC were assessed using log-binomial regression analysis. Findings were expressed as prevalence ratios with associated standard errors and 95% confidence intervals. Control groups were gathered from adequate literature, the Finnish Institute for Health and Welfare, and Official Statistics of Finland.
Results: Our study showed that diabetes, smoking, high alcohol consumption, blue-collar worker employment, and upper secondary education are risk factors for DC. These findings were statistically significant. Similar findings were observed in the subgroup analysis of men and women, though the statistical power of these analyses was reduced, especially in women.
Conclusions: This study strengthens previous findings that diabetes, smoking, high alcohol consumption, and blue-collar worker employment are plausible risk factors for DC. However, we do not truly know which factors are true risk factors and which ones appear to be due to confounding effects. Future research should aim to distinguish genuine risk factors from false ones.

A-0630 A PATIENT'S LIFETIME JOURNEY: THE PRENATAL, PAEDIATRIC AND ADULT MULTIDISCIPLINARY CONGENITAL HAND AND UPPER LIMB DIFFERENCES CLINIC MODEL

Lorenzo Garagnani[1,2,3], Muriel Holder-Espinasse[2], Elise van der Veen[2], Joanna Lloyd[1], Rebecca Fortescue[1]
[1]Evelina London Children's Hospital, UK; [2]Guy's and St Thomas' NHS Foundation Trust, London, UK; [3]King's College London, UK

Introduction: Congenital hand and upper limb differences assessment and treatment require a multidisciplinary approach, both in the prenatal period and after the child's birth, throughout their growth and into their adulthood. A multidisciplinary patient and family assessment from the very first time they present to the clinicians' attention, with consideration of any differential aetiology, is paramount for the care of these patients. This approach allows early detection of potential associated disorders. Syndromic patients, patients with rare disorders and families benefit from a genetic review not only for diagnostic and prognostic purposes, but also due to the potential genetic transmissibility of some conditions. Treatment of hand and upper limb differences requires an integrated, holistic approach where non-operative treatment with hand and occupational therapy may represent the first or sole treatment required. Surgical treatment is offered at the appropriate stage to patients requiring it and is coordinated with the hand and occupational therapy teams, to provide appropriate pre-operative and post-operative care.
Aim: To demonstrate the value in terms of improved patient and family experience, diagnostic process, clinical communication and treatment of a multidisciplinary clinic model where the healthcare professionals who are involved in the continued patient's care are present simultaneously and can also follow the patients' journey from the prenatal period into their adulthood, providing lifetime continuity of care.
Material & Methods: The multidisciplinary congenital hand & upper limb differences (CHULD) clinic of Guy's and St Thomas' NHS Foundation Trust in London (UK) was founded in 2016 by a consultant clinical geneticist and a consultant hand surgeon both with a special interest in congenital limb differences and the hand and occupational therapy teams. The hand surgeon had previously practised in a similarly structured clinic in Modena (Italy). Guy's and St Thomas' multidisciplinary CHULD clinic in London is a pioneering initiative and one of a kind in the UK, not only due to the fact that simultaneous genetic, surgical and therapies assessment and expertise are available during the same outpatient appointment, but also due to the fact that both paediatric and adult patients can be assessed and treated and prenatal counseling is also offered. Any further specialist referral that may be required is also agreed and arranged for the patient. Patient and family feedback and patient cases have been recorded.
Results: The features and outcomes of the CHULD multidisciplinary clinic are reported, including patient and family feedback and the outcomes relating to the detection and care of rare disorders and treatment offered. Patient case examples are

discussed, and considerations relating to the importance and current outcomes of prenatal diagnosis are also included.
Conclusions: The presence of the multidisciplinary team members involved in the initial and continued patient's assessment and care in the same clinic improves the diagnostic process, the team communication and the agreement and coordination of patient care. The patient and family experience is also markedly improved, as they have simultaneous access to multidisciplinary specialist expertise and do not need to attend multiple appointments on different occasions with the related travel, time and financial implications.

A-0631 BEYOND SURGERY: A PRELIMINARY STUDY OF LONG-TERM PAIN COPING STRATEGIES IN PATIENTS WITH TRAPEZIOMETACARPAL OSTEOARTHRITIS

Tugba Ulusoy[1], Cigdem Ayhan Kuru[1], Merve Sumeyye Yılmaz[1], Kazım Onur Unal[2], Metin Akıncı[2], Ilhami Kuru[3]
[1]Faculty of Physiotherapy and Rehabilitation, Department of Orthopedic Physiotherapy and Rehabilitation, Hacettepe University, Ankara, Turkey; [2]University of Health Sciences Ankara City Hospital, Department of Orthopedics and Traumatology, Ankara, Turkey; [3]Faculty of Medicine, Department of Orthopedics and Traumatology, Baskent University, Ankara, Turkey

Introduction: The trapeziometacarpal joint is the site of the upper extremity most frequently requiring surgical reconstruction for osteoarthritis (OA). The most commonly used procedure is the ligament reconstruction and tendon interposition (LRTI) described by Burton and Pellegrini, in which half the width of the FCR tendon is used to support the base of the thumb metacarpal after excision of the trapezium. Studies have shown that patients treated surgically with LRTI arthroplasty have improved pinch strength, increased grip strength and restored thumb web space. Postoperative outcomes are significantly influenced by patients' psychosocial status, which affects their pain coping strategies and ultimately determines both surgical success and the effectiveness of rehabilitation.
Aim: To investigate the long-term pain coping strategies of patients surgically treated with LRTI and their functional outcomes based on the coping strategies.
Material & Methods: In this observational study, eight patients (age: 64.00±5.50 years; BMI: 25.34±5.15 kg/m2) were examined after an average of 5.3 years postoperatively. Flexion and abduction of the trapeziometacarpal joint were measured with a goniometer, grip strength with a JAMAR dynamometer and lateral pinch strength with a pinch meter. Lateral pinch pain intensity was assessed using the visual analog scale (VAS). Upper extremity disability was assessed using the Quick-DASH (Disabilities of the Arm, Shoulder and Hand) and thumb disability was assessed using the Thumb Disability Examination (TDX). Pain coping strategies were assessed using the Pain Coping Questionnaire (PCQ), which comprises four subgroups: Self-management, helplessness, conscious cognitive interventions and search for medical remedy. Patients were grouped according to their pain coping strategies and functional outcomes were analyzed.
Results: Six out of 8 people tended to develop a self-management strategy. While one person tended towards the strategy of helplessness, the other person tended towards the strategy of conscious cognitive interventions. No one tended towards the strategy of search for medical remedy. The lateral pinch strength of those leaning toward the self-management strategy was lower than the others (self-management: 0.95±0.90; helplessness: 2.50; conscious cognitive interventions: 2.00) and TDX and QuickDASH scores were significantly higher than the other groups (self-management: 62.50±28.64; 51.16±32.79 helplessness: 19; 36.36; conscious cognitive interventions: 42; 36.36, respectively).
Conclusions: The findings showed that most postoperative patients tended towards a strategy of self-management, while none tended towards a strategy of search for medical remedy. This suggests that a patient may avoid seeking medical help, not because they do not need it, but because of the coping strategies they have chosen. This underlines the importance of long-term follow-up for these individuals, as it allows us to recognize emerging problems at an early stage.

A-0632 NATIONWIDE RATES OF LIMITED FASCIECTOMY FOR DUPUYTREN'S CONTRACTURE

Mikko Räisänen[1,2], Teemu Karjalainen[2,3], Tuomas Tapani Huttunen[1,4], Ville Mattila[1,5], Aleksi Reito[5], Olli Leppänen[5], Janne Soikkeli[6], Jarkko Juhani Jokihaara[1,5]

[1]Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland; [2]Department of Orthopaedics, Traumatology and Hand surgery, Kuopio University Hospital, Kuopio, Finland; [3]Department of Surgery, Hospital Nova of Central Finland, Jyväskylä, Finland; [4]Department of Anesthesiology, Tampere University Hospital, Tampere, Finland; [5]Division of Musculoskeletal Diseases, Tampere University Hospital, Tampere, Finland; [6]Department of Hand surgery and Orthopedics, Oulu University Hospital, Oulu, Finland

Introduction: Dupuytren's contracture is often treated with limited fasciectomy, while percutaneous treatment options are gaining popularity. The recent trends in the incidence rates of limited fasciectomies are unknown.

Aim: Our study aimed to investigate the incidence rates of limited fasciectomies, and we collected nationwide data on all limited fasciectomies performed between January 1, 1997, and December 31, 2018.

Material & Methods: The main outcome variables were the incidence rates of first and subsequent limited fasciectomies per 100,000 person-years, calculated for each study year, gender, and age group. Data were obtained from the Finnish National Hospital Discharge Registry, which provides comprehensive information on patients' age, sex, duration of hospital stays, primary and secondary diagnoses, and all operative treatments. Reporting data to the registry is mandatory for all public and private hospitals. The data cover the entire Finland, and its validity, i.e., coverage and accuracy, have been found excellent in describing the rates of surgical procedures. All adult patients with surgical procedure code NDM10 for limited fasciectomy in the Nordic Medico-Statistical Committee classification of surgical procedures and International Classification of Diseases code M72.0 for Dupuytren's contracture were included in this study.

Results: Within the study period, the incidence rate of the first limited fasciectomies declined from 36.5 to 11.7, while the rate of subsequent limited fasciectomies increased from 2.3 to 14.0 from 1997 to 2011 and then declined to 9.3 in 2018. Limited fasciectomy was performed significantly more often in men than in women, with a ratio of about 4:1. Additionally, it was performed significantly more often in patients between 60-79 years than in other age groups.

Conclusions: Despite the estimated increase in the prevalence of Dupuytren's contracture, our data shows that the incidence rate of first limited fasciectomies has declined, and there was no discernible constant trend in the incidence of subsequent limited fasciectomies during the same period. The reasons behind the changes remain uncertain, but treatments performed through the skin, such as Clostridium collagenase histolyticum injections and percutaneous needle fasciotomy, may have contributed to the observed effects.

A-0633 STREAMLINING NAIL BED REPAIRS: REDUCING SURGERY THROUGH INNOVATION AND NEW APPROACH

Jerocin Vishani Loyala, Sarah Tucker

Oxford University Hospital, Oxford, UK

Introduction: Nail bed injuries are common hand traumas that often require surgical intervention, previously involving full theatre facility and general anaesthesia. However, over the past decade, significant advancements in conservative management techniques and procedural innovations have transformed the approach to these injuries partly accelerated by Covid-19 pandemic. This study analyses a 10-year experience in nail bed injury management at a tertiary centre in the United Kingdom, highlighting the impact of these changes on clinical and patient reported outcomes.

Aim: This study aims to assess the outcomes of conservative management strategies, the use of local anaesthesia, and

MOPS (Minor Operations Procedures) rooms and an Online Acute Referral System (OARS), in reducing the need for full theatre interventions in nail bed injury management.

Material & Methods: This retrospective analysis reviewed nail bed injury cases managed between 2013 and 2023 at a tertiary UK centre. Data were collected on the number of cases requiring theatre capacity and use of local anaesthesia. Patient-reported outcome measures (PROMS) were obtained via electronic questionnaires to evaluate patient satisfaction and outcomes following conservative or surgical management since the adaptation of OARS 2020.

Results: The study observed a significant reduction in nail bed repairs requiring full theatre capacity, decreasing from 239 cases in 2013 to 18 in 2023. This trend was primarily attributed to the shift towards conservative management and the use of local anaesthesia which was brought on strongly by COVID-19 pandemic. Consultant oversight on OARS showed an effective reduction to unnecessary procedures by identifying cases amenable to conservative treatment or minor surgery under local anaesthesia. The introduction of MOPS rooms provided a dedicated space for minor procedures, alleviating the burden on theatres and enhancing resource efficiency. The implementation of the OARS system, which allows for the review of photographs submitted online, was found to be a safe and efficient method for triaging nail bed injuries, reducing unnecessary surgical interventions and general anaesthesia use. Patient satisfaction, measured via PROMS, was high among those managed conservatively, with positive outcomes in functional recovery and overall experience. Patients reported similar satisfaction with cosmetic and functional results, regardless of whether their injuries were managed surgically or conservatively

Conclusions: This study demonstrates the benefits of adopting conservative management, local anaesthesia use, and the innovation of digital triage systems with photograph managed with full consultant oversight and benefits of procedural environments such as MOPS rooms in optimising resource use to reducing surgical procedures while maintaining good standard of care. The findings suggest that these strategies could be beneficially adopted by other healthcare centres to improve time and cost efficiency while maintaining a patient-cantered approach to nail bed injury management.

A-0634 USE OF ANGIOTENSIN-CONVERTING ENZYME INHIBITORS (ACEI) AND ANGIOTENSIN-2 RECEPTOR BLOCKERS (ARBS) IS ASSOCIATED WITH INCREASED RISK FOR CARPAL TUNNEL SYNDROME, BUT NOT FOR ULNAR NERVE ENTRAPMENT, IN HEALTHY INDIVIDUALS AND IN TYPE 2 DIABETES

Lars B Dahlin[1,2,3], Anders Gottsäter[4], Raquel Perez[1,5], Peter M. Nilsson[4], Malin Zimmerman[1,6], Juan Merlo[5,7]

[1]Department of Translational Medicine – Hand Surgery, Lund University, Skåne University Hospital, Malmö, Sweden; [2]Department of Hand Surgery, Lund University, Skåne University Hospital, Malmö, Sweden; [3]Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden; [4]Department of Internal Medicine, Lund University, Skåne University Hospital, Malmö, Sweden; [5]Unit for Social Epidemiology, Department of Clinical Sciences (Malmö) Faculty of Medicine, Lund University, Malmö, Sweden; [6]Department of Orthopedics, Helsingborg Hospital, Helsingborg, Sweden; [7]Center for Primary Health Research, Region Skåne, Malmö, Sweden

Introduction: The complex pathophysiology of carpal tunnel syndrome (CTS) and ulnar nerve entrapment (UNE) are not clarified and differ, with associated risk factors still being obscure. Type 2 diabetes (T2D) is a well-known risk condition for development of nerve entrapment disorders; potentially based on concurrent peripheral neuropathy and obesity. Angiotensin-converting enzyme (ACE) I/D polymorphism is suggested to increase susceptibility to develop CTS. Pharmacological inhibition of the renin-angiotensin system may be of benefit to prevent neuropathy accompanying T2DM. Both angiotensin-converting enzyme inhibitors (ACEi) and angiotensin-2 receptor blockers (ARBs) inhibit peripheral and autonomic diabetic neuropathy. ARBs reduce neuropathic pain.

Aim: We hypothesised that ACEi and ARB have different risk patterns between CTS and UNE for each drug class, with a differential effect in healthy individuals and in T2D, as well as with a potential risk difference between ACEi and ARBs to develop CTS or UNE.
Material & Methods: Data from 4,831,083 individuals, of which 244,220 had T2D, were extracted from a database consisting of five linked Swedish national registers, excluding individuals with a previous diagnosis of CTS (ICD-code G56.0) or UNE (G56.2), other types of diabetes, death, emigration, missing information of country of birth, or cohabitation. Baseline was set at first diagnosis of CTS or UNE during 2011-2014, or on January 1st, 2011, if individuals had no nerve entrapment disorder. Multinominal regression was used to analyze risk for developing CTS and UNE by use of ACEi (ATC-codes C09A and C09B) and ARBs (C09C and C09D), expressed as Relative Risk (RR; 95% confidence intervals) adjusted for demographic and socioeconomic factors (age, sex, income level, country of birth, and cohabitation status). Potential indications for treatment with ACEis or ARBs within five years prior to baseline, such as hypertensive disorders (I10-I15), ischemic heart diseases (I20-I25), congestive heart disease (I50), renal disorders (N00-N19), and obesity were adjusted for.
Results: Among the 4,831,083 evaluated individuals, 938,065 (19,42%) were treated with ACEis or ARBs and 47,214 were diagnosed with CTS and 8,339 with UNE, corresponding to an expected increased risk for CTS [1.3 (1.3-1.4)] and UNE [1.2 (1.1-1.3)] if having T2D. Increased risks for development of CTS, but not of UNE, were observed if individuals were treated with ACEis or ARBs [adjusted; 1.2 (1.2-1.2) and 1.1 (1.0-1.1), respectively]. When analyzing ACEis and ARBs separately in relation to development of CTS or UNE, risk increase was more pronounced in individuals treated with ARBs [1.4 (1.4-1.5) and 1.2 (1.1-1.3), respectively] than in those treated with ACEis [1.3 (1.3-1.4) and 1.0 (0.9-1.1), respectively]. When stratified for T2D or not, an association for CTS, but not UNE, if treated with ACEi or ARBs, were observed among individuals without [1.2 (1.2-1.3) and 1.1 (1.0-1.2), respectively], and with T2D [1.2 (1.1-1.2) and 1.0 (0.8-1.2), respectively].
Conclusions: Treatment with ACEis and ARBs was associated with increased risk for developing CTS, but not UNE, when adjusted for demographic and socioeconomic factors, as well as for hospital-diagnosed cardiovascular risk conditions, nephropathy, and obesity. T2D did not impact risk pattern. Treatment with ARBs potentially increases risk for UNE.

A-0635 THE EFFECT OF CERVICAL X-RAY RADIOLOGICAL MEASUREMENTS ON DIAGNOSIS AND TREATMENT IN TOS

Ugur Bezirgan[1], Orhun Eray Bozkurt[2], Ebru Dumlupinar[3], Mehmet Armangil[1]
[1]Ankara University Faculty of Medicine,Orthopaedics and Traumatology Department, Hand Surgery Unit; [2]Kulu State Hospital Orthopaedics and Traumatology Department; [3] Ankara University Faculty of Medicine, Biostatistics Department

Introduction: Neurogenic Thoracic Outlet Syndrome (TOS) is marked by compression or injury of neural structures within the thoracic outlet, with anatomical variations contributing to its development. In TOS patients, spinal nerves exhibit specific angulations as they exit the roots and enter the thorax. We believe that the tension of the subpleural bands extending between C7 and the first rib, along with changes in neck position, anatomical variations, and angulations, may lead to compression of the lower truncus.
Aim: This study aimed to determine whether these angulations lead to lower truncus compression through the suprapleural membrane, hypothesizing a higher likelihood of compression in TOS patients compared to the normal population.
Material & Methods: Patients diagnosed with neurogenic TOS between 2015 and 2023 were retrospectively included, along with a matched control group. Cervical anteroposterior and lateral radiographs were evaluated to calculate T1 slope, neck tilt, and measure the T1 transverse process's length and the angle between the T1 transverse process and the T1 corpus. We anticipated that these radiological parameters, measured predominantly in patients with cervical spondylosis, could also have a compressive effect on the nerves after exiting the foramen. These parameters were compared between groups.

Thoracic Outlet Syndrome Index (TOSI) scores and surgical approaches were documented for patients undergoing surgery. Results: The mean age of the 52 patients included in the study was 34.23 ± 11.15. Of these, 24 were in the TOS group, and 28 were in the control group. TOS and control groups showed significant differences in neck tilt and T1 transverse process angle ($p = 0.04$, $p = 0.004$). No significant relationship was found between T1 slope, T1 transverse process length, and TOS. Neck tilt was 43 degrees in the TOS group and 48 degrees in the control group, while the T1 transverse process angle was 106.5 degrees in the TOS group and 116.5 degrees in the control group. Of the 16 patients who underwent surgery, 13 (81.25%) had a supraclavicular approach, 2 (12.5%) had a combined approach, and 1 (6.25%) had an infraclavicular approach. All surgeries included fibrous band excision and middle scalenectomy. Among 16 surgical patients, TOSI score was 26.2 preoperatively and 2.23 postoperatively, and this difference was statistically significant ($p < 0.001$).
Conclusions: Strain in anatomic bands over Sibson- Truffert's fascia, increased with bad neck posture, may contribute to lowertruncus compression in TOS. Additionally, these bands are excised through a supraclavicular approach, resulting in satisfactory clinical outcomes.In the literature, there are publications indicating that chiropractic spinal manipulation corrects cervical extension defects and supports the reformation of cervical lordosis. However, the lack of data from control radiographs to demonstrate this anatomical correction in the patients we treated, who showed significant improvement in their symptoms, represents a major limitation of our study. In conclusion, neck tilt and T1 transverse process angle may be valuable preoperative indicators of lower truncus compression, and supraclavicular surgical treatment yields favorable outcomes.

A-0636 INCIDENCE RATES OF IMPLANT ARTHROPLASTIES, OPEN REDUCTION AND INTERNAL FIXATION IN RADIAL HEAD, DISTAL HUMERUS AND COMPOUND ELBOW FRACTURES – NATIONWIDE STUDY IN FINLAND

Mikko Räisänen[1,2], Aleksi Reito[3], Joonas Sirola[2,4], Matti T Juntunen[2], Yrjänä Nietosvaara[5], Reijo Sund[6,7]
[1]Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland; [2]Department of Orthopedics, Traumatology and Hand surgery; Kuopio University Hospital; Kuopio, Finland; [3]Department of Musculoskeletal Diseases, Tampere University Hospital, Tampere, Finland; [4]The School of Medicine, University of Eastern Finland, Kuopio, Finland; [5]Department of Pediatric Surgery, Kuopio University Hospital, Kuopio, Finland; [6]Kuopio Musculoskeletal Research Unit, Faculty of Health Sciences, University of Eastern Finland, Finland; [7]Health and Social Economics Unit, Department of Health and Social Care Systems, Finnish Institute for Health and Welfare, Helsinki, Finland

Introduction: Fractures of the radial head and distal humerus are common, and treatment can be challenging, often resulting in significant loss of upper limb function, particularly in cases of more severe comminuted fractures. Surgical treatment options include open reduction, internal fixation (ORIF) and implant arthroplasty.
Aim: The aims of this study are: 1) to determine whether the nationwide incidences of radial head, distal humeral, and compound elbow fractures' implant arthroplasties are rising, 2) to assess whether the proportions of implant arthroplasties compared to ORIF are increasing, and 3) to examine whether the mean ages of patients with operated fractures are rising during the study period.
Material & Methods: All implant arthroplasties for radial head and distal humeral fractures performed between January 1, 1997, and December 31, 2020, were included in the analysis. Additionally, information on all cases of ORIF during the same period was collected to serve as a control group. The data were retrieved from the Finnish National Care Register for Health Care. The main outcome was the incidence rate of implant arthroplasty or ORIF for radial head or distal humeral fractures per 100,000 person-years, calculated for each study year.
Results: A mean of 16.9% (SD 14.0, range 0.0-52.1) of operatively treated isolated radial head fractures, 3.2% (SD 1.9, range 0.0-7.9) of isolated distal humeral fractures, and 15.7% (SD 14.1, range 0.0-50.0) of compound elbow fractures

were treated with implant arthroplasty and the rest with ORIF. The annual relative change in the incidence of implant arthroplasties averaged 12.7% (95% CI from 0.7% to 29.6%; p=0.06) for operatively treated isolated radial head fractures, 7.6% (95% CI from -6.1% to I 26.6%; p=0.3) for isolated distal humeral fractures, and 13.2% (95% CI from -7.4% to 52.4%; p=0.3) for compound elbow fractures. In contrast, the annual relative change for ORIF was 0.8% (95% CI from -3.3% to 5.3%; p=0.7), 0.2% (95% CI from -2.2% to 2.6%; p=0.9), and 5.3% (95% CI from -2.4% to 14.2%; p=0.2), respectively. Conclusions: This study demonstrates a rising trend in the use of implant arthroplasties for the treatment of elbow fractures. Based on positive outcomes reported in the literature, implant arthroplasties can achieve satisfactory results—potentially even superior to ORIF—particularly in cases of severe, complex fractures.

A-0637 MANGLED HAND, AETIOLOGY, SCORING, MANAGEMENT, OUTCOMES. A REVIEW OF 38 CASES

Vasiliki Tsiampa,Dimitrios Arapoglou, Georgios Prelorentzos, Ioannis Ignatiadis
KAT General Hospital of Athens, Attica Greece

Introduction: Mangled hands refer to disfiguring severe injuries that affect many anatomical components. These injuries are evaluated using various scoring systems. In adition, we need to include critical aspects relating to the patient ,such as trauma origin, prognosis,procedure.
Aim: The significance of accidents etiology in assessing trauma and predicting outcomes,as well as their value in guiding decisions for trauma treatment.
Material & Methods: Thirty -eight patients, from 16 to 64 years, have been treated for upper limb compound injuries at our hospital between 2004 and 2009. We registered 12 blast injuries ,13 work accidents ,7 motor vehicle accidents, and 6 gunshot injuries.The SATTy assessment method was used to evaluate the prognosis on viability and functionality. Additionally we studied the influence of the etiological factor on injury prognosis.The functional results have been assessed by the MMTGS (manual muscle testing grading system) while the final results of the limb usefulness(ability-disability) have been evaluated by DASH score test(self-questionnaire).
Results: Eigtheen cases involved major vascular lesions that required emergency reconstruction,or amputation.Our findings indicate that cases with blast injuries managed by partial or total amputations or usind flaps to close stumps, had poor prognosis. For cases with work related injuries, we performed revascularization or flaps where the likelihood of saving the limbs was deemed higher than the potential risks of postoperative complications. In cases with gunshot injuries,despite the low overall functioning see, primary approach was to repair rather than amputating due to potential feasibility of achieving viability. Patients with motor vehicle accidents had undergone to the lowest rate of amputations and upper limb disabilty.
Conclusions: This study showed that further investigation should be done to determine if the cause of trauma has an important impact on trauma evaluation scores and predicting trauma outcomes ,furthermore helping decision making in emergencies.We should always attempt to save the hands, because even using the most modern prosthesis ,the patients prefer keeping their native limb, even with a relative remaining disability.

A-0638 A NEW GRADING SYSTEM FOR ULNAR NERVE ENTRAPMENT AT THE ELBOW - SUCCESSFULLY TESTED AND EVALUATED IN A PROSPECTIVE CLINICAL SETTING

Erika Nyman[1,2], Sanna Werkkonen[2], Lotta Fornander[3,4], Lars B Dahlin[2,5,6]

[1]Department of Hand Surgery, Plastic Surgery and Burns, Linköping University Hospital, Linköping, Sweden; [2]Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden; [3]Department of Orthopedic Surgery, Vrinnevi Hospital, Norrköping, Sweden; [4]Department of Biomedical and Clinical Sciences, Linköping University, Norrköping, Sweden; [5]Department of Hand Surgery, Skåne University Hospital, Malmö, Sweden; [6]Department of Translational Medicine – Hand Surgery, Lund University, Malmö, Sweden

Introduction: There is currently no consensus on treatment guidelines for ulnar nerve entrapment at the elbow (UNE), and the outcomes of surgical intervention can be unpredictable. Existing symptom grading systems are inadequate for distinguishing the various stages of this condition and do not correlate with any treatment algorithms. Thus, there is a need to develop a new grading system that can differentiate symptoms and disabilities with the intention to be used in prospective clinical studies on treatment of UNE.

Aim: This study aimed to develop and assess a new six-grade categorising system for UNE.

Material & Methods: In a prospective clinical setting, patients diagnosed with UNE (n=146) were included and graded according to the following criteria:

Grade 1: Intermittent sensory symptoms without motor symptoms (n=23; 16%).

Grade 2: Intermittent sensory symptoms with subjective motor symptoms, but no objective motor impairment (n=28; 19%).

Grade 3: Constant sensory symptoms without motor symptoms (n=8; 6%).

Grade 4: Constant sensory symptoms with subjective motor symptoms, but no objective motor impairment (n=25; 17%).

Grade 5: Constant sensory symptoms with objective motor impairment, but no muscle atrophy (n=37; 25%).

Grade 6: Constant sensory symptoms with both motor impairment and muscle atrophy (n=25; 17%).

Demographic and comorbidity information was collected using forms and a clinical assessment to identify typical signs and clinical findings. Standardized tests were conducted to evaluate sensibility and muscle strength and also other tests used to judge the participants with UNE. Participants completed several forms, including the Patient-Rated Ulnar Nerve Evaluation (Swedish version; PRUNE-S). Analyses were then performed to identify differences between the symptom grading groups.

Results: Females were in majority (76/146; 52%; generally no differences in characteristics, co-morbidities or grading between sex). Median population age was 51 years [IQR 25]. Median symptom duration was 18 months ([IQR 26]; range 0.5 - 420 months; no significant difference between grading groups). Males were overrepresented among those with grade 6 (21/25; 84%; median age grade 6: 57 [IQR 27] years) and participants with grade 6 were significantly older than those in the other groups. Additionally, there was a decline in both sensibility (i.e., monofilament and 2-PD) and individual muscle strength as well as pinch strength as the severity of symptoms increased. Data indicates that the grading system is related to the old McGowan scale, and differentiate well with experienced symptoms, clinical signs and tests; thus, it effectively classifies symptom severity based on sensory and motor function. The overall PRUNE-S score (median total score 41 [IQR 30]) and its subscales rise with higher symptom grades. Results from other assessment tools revealed that participants with the highest symptom grades experienced significantly lower quality of life, increased levels of depression, and greater kinesiophobia.

Conclusions: The new grading system represents the symptom severity of UNE at different stages of the condition well. The system addresses specific sensory and motor impairments for UNE and could serve as a basis for treatment algorithms.

A-0640 FAT INJECTION AND LIPOCUBE APPLICATION IN DUPUYTREN'S DISEASE

Percin Karakol, Yalçın Akbulut, İbrahim Enes Aydoğan, Mert Noyan Dabak, Yasin Canbaz
Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, İstanbul Türkiye

Introduction: Dupuytren's disease is a fibroproliferative disease of the superficial palmar fascia of unknown etiology that causes progressive flexion deformity of the fingers. Pitting and thickening of the palmar skin is the earliest symptom. However, the diagnosisis made by the presence of a painless firm nodule localized to the skin or fascia. The nodule transforms into a cord over the years. When the cord begins to form, it contracts and causes progressive flexion contracture of the metacarpophalangeal joint and proximal interphalangeal joint. Many factors such as liver disease, diabetes mellitus, smoking have been identified in the etiology. There are different surgical and non-surgical treatments according to the degree of the disease. Fat injection (PALF) and lipocube application are considered as effective and safe options in the treatment of early Dupuytren's contracture.

Aim: Comparing lipocube application and fat injection

Material & Methods: Between January 2023 and October 2024, 16 patients (12 males and 4 females) aged between 46 and 69 years who were treated with fat injection and lipocube application after needle aponeurotomy were evaluated. 3 patients had bilateral hand involvement. 6 patients were smokers, 10 patients had type 2 diabetes mellitus, 10 patients had family history and 2 patients had liver disease.

Results: Postoperative measurements were taken at 1 and 3 months and the degree of contracture was recorded. No major complications such as hypoesthesia, wound dehiscence and hematoma due to neurovascular damage were observed in any patient. Postoperatively, MCP joint flexion contractures reached almost normal ROM range, while some PIP joint contractures persisted due to pathologic changes in the structures around the joint capsule. Preoperatively, there was a mean flexion contracture of 19.30±5.94 degrees in PIP joints and 19.76±5.68 degrees in MCP joints. At 3 months postoperatively, these measurements were 6.30±2.13 and 4.30±1.93 in patients who underwent microfat fat injection and 5.24±2.07 and 3.75±1.87 in patients who underwent lipocube and nanofat fat injection, respectively. There was a statistically significant difference between these measurements according to preoperative contracture in both procedures ($P < 0.001$). There was no significant difference between microfat fat injection and lipocube application. No recurrence was seen in any patient during the follow-up period

Conclusions: Technically, damage to neurovascular structures by injection is common to all closed methods, but it is possible to avoid the side effects of steroids and collagenase. As in open surgery, postoperative extension splint and effective physical therapy for all patients are important for long-term success and prevention of recurrence. In our study, patients treated with this method were followed up for an average of 6 months. We think that Lipocube application improves skin quality more, reduces the risk of recurrence and is a more effective treatment. While patients benefit from the method with minimal risk and maximum efficiency, we think that at least 1 year follow-up is necessary for longer-term results. It is clear that the benefits of the method will be better demonstrated with larger randomized controlled trials.

A-0641 OUR EXPERIENCE WITH OPEN PALM MCCASH FOR TREATMENT OF DUPUYTREN'S CONTRACTURE

Milos Vucetic[1,3], Suzana Milutinovic[2,3], Sladjana Matic[2,3], Aleksandar Matejic[1,3]
[1]Institute for Orthopaedics 'Banjica', Belgrade, Serbia; [2]Clinical Centre of Serbia, Clinic for Orthopaedic Surgery and Traumatology, Belgrade, Serbia; [3]Medical Faculty, University of Belgrade, Belgrade, Serbia

Introduction: Among many surgical options for the treatment of severe Duputren's disease (Tubiana III and IV) we chose Mc Cashe's method as a safe and effective method.

Aim: The aim of our work is to prove safety and result predictability of Open Palm Mc Cashe method for the treatment of primary Duputren's disease.
Material & Methods: Data was prospectively collected on 50 consecutive open palm operations by a single surgeon over a 5-year period. We included only primary cases in this study. Outcome measurements were correction of MCP contracture, postoperative complications and recurrence, as well as healing duration and patient satisfaction.
Results: Our results with Open palm technique results are satisfactory. No cases of cutaneous suffering and infection were recorded. The residual extension deficit, evaluated at 6 months, in all of the 50 patients, was on average of 10°. One patient developed CRPS which was afterwards successfully treated. Average healing time was 21 days. The overall patient satisfaction was high. During the follow up period of 36 months there was no recurrence of disease recorded.
Conclusions: Open palm method is a safe method with predictable results, we consider it as a method of choice for the primary Tubiana III and IV cases.

A-0642 ECONOMICAL AND ENVIRONMENTAL ANALYSIS OF ULTRASOUND-GUIDED A1 PULLEY RELEASE IN AN OFFICE BASED SETTING. A COMPARATIVE STUDY

Cristina Lloret Peiró, Júlia Bargalló Granero, Miguel Nuño Pérez, Irene Gallardo Calero, Ignacio Esteban Feliu
Hospital Universitari Vall d\'Hebron, Barcelona, Spain

Introduction: The operating room (OR) is one of the main causes of healthcare expenditure as well as one of the first waste sources in the healthcare system.
Trigger finger is one of the most frequent problems in hand surgery. In our context, it is mainly performed in the OR via open release of A1 pulley. Percutaneous, ultrasound guided techniques for trigger finger have been gaining popularity over the past years, demonstrating both its efficiency and safety.
The implementation of this technique for trigger finger treatment in an office based environment would be part of the "Lean and Green" initiatives, which aim to reduce costs and waste while improving safety and patient satisfaction. Aim: The aim of the present study is to evaluate potential cost and waste reduction by implementing ultrasound-guided A1 pulley release for trigger finger in an office based setting compared to the standard open procedure in the OR
Material & Methods: We designed a pilot, transversal study in a single Spanish public hospital.
There are two study groups: open surgery (OS) in the OR performed as major ambulatory surgery and ultrasound-guided surgery (US) in an office based setting. Patients included in the study were those that we were able to operate on in three 8 – hour surgical blocks.
We calculated human (only healthcare workers) and material (single use and re-sterilization) costs for each procedure. Environmental impact was calculated by weighing waste at the end of the procedure.
Administrative and cleaning related costs, as well as anaesthetic drugs, were not considered in this study. Results: 18 patients were included in OS group and 33 in US group.
Total material cost for the US group was 128 euros and 56.5 in OS group, meanwhile costs related to human resources were 26.3 euros in US group and 144 in OS group. That is a 23% reduction of total cost in US opposed to OS ($p<0.05$).
Waste production was 404.28 grams in US group and 2155.2 grams in OS group, resulting in a waste production reduction of 433% for US group ($p<0.05$)
Conclusions: The implementation of an ultrasound-guided office based program for the treatment of trigger finger results in a significant reduction of both global costs and clinical waste.
Moreover, the standard procedure in the OR associates a higher cost in administrative and cleaning services, initial follow-

up visits in office and anaesthetic procedures that are not considered in the present study. Furthermore, US procedures could allow, according to previous studies, earlier return to work, which would result in a decrease in sick paid days.
On the other hand, no clinical follow-up has been performed in this study, neglecting potential complications and reoperation rates, that may impact the final cost.
Additional clinical studies, with larger samples and follow-up, should be conducted in order to draw further conclusions. We believe that this green and lean model could be applied to other hand surgery procedures, resulting in a cost-effective initiative for Spanish national health service (SNS).

A-0643 STRENGTH DURATION CHARACTERISTICS OF THE SENSORY BRANCHES OF THE RADIAL AND ULNAR SENSORY NERVES IN INDIVIDUALS WITH TRAPEZIOMETACARPAL OSTEOARTHRITIS

Merve Sumeyye Yılmaz[1], Cigdem Ayhan Kuru[1], Tugba Ulusoy[1], Akın Uzumcugil[2], Ilhami Kuru[3]
[1]Faculty of Physiotherapy and Rehabilitation, Department of Orthopedic Physiotherapy and Rehabilitation, Hacettepe University, Ankara, Turkey; [2]Faculty of Medicine, Department of Orthopedics and Traumatology, Hacettepe University, Ankara, Turkey; [3]Faculty of Medicine, Department of Orthopedics and Traumatology, Baskent University, Ankara, Turkey

Introduction: Neurophysiologic testing may provide additional benefits when investigating sensory and motor changes that may contribute to disability due to trapeziometacarpal osteoarthritis (TMC OA). The sensory branch of the radial nerve (SBRN) provides innervation to the thumb, and several recent studies have reported nerve conduction changes in the SBRN in TMC OA. Chronic musculoskeletal conditions in one area of the body often lead to problems in other areas, especially contralaterally which is a common phenomenon observed in various conditions. Assessment of nerve excitability of the SBRN and the dorsal branch of the ulnar nerve (DBUN) using nerve excitability tests (NETs) in clinical practice could improve rehabilitation strategies.
Aim: The aim of this study was to determine excitability changes in the radial and ulnar nerve sensory branches in patients with TMC OA.
Material & Methods: Twenty-one patients (mean age and SD, 63.2±6.9) diagnosed with TMCOA and twenty-three healthy individuals (mean age and SD, 45.0±16.1) were included in the study. NETs including rheobase, chronaxie, and Strength Duration Curve (SDC) were performed using a BTL-Vac II device with using a pulsed galvanic current. Electrode placements were done according to the set-up for recording sensory nerve action potentials. For SBRN test, the active electrode was placed distal to the snuffbox and the passive electrode was placed 10 cm proximal to the active electrode. For DBUN test, the active electrode was placed distal to the ulnar styloid and the passive electrode was placed 10 cm proximal to the active electrode. The intensity was slowly increased until eliciting a minimal tingling sensation was observed and recorded as a rheobase value in mA. Twice the rheobase value was used to determine the time required to elicit a minimal tingling, which was recorded in msec as the chronaxie. An SDC plot is derived by combining the values representing the temporal characteristics of the excitation starting with shorter stimulus durations to longer durations (1000, 700, 500, 300, 200, 100, 70, 50, 30, 20, 10, 7, 5, 3, 2, 1, 0.7, 0.5, 0.3, 0.2 and 0.1 msec).
Results: There were significant differences in the excitability properties of the SBRN and DBUN between TMCOA patients and controls ($p<0.05$). Rheobase values of SBRN and DBUN were increased in patients with TMC OA ((median (IQR): 1.50 mA (0.90 - 1.70) and 1.40 mA (1.20-1.70), respectively) than the control group ((median (IQR): 1.00 mA (0.80-1.40) and 1.00 mA (0.75-1.35) respectively.) Chronaxie value of the SBRN ((median (IQR): 0.60 msec (0.60-0.80) was decreased compared to healthy controls (0.88 msec (0.62-1.40)) respectively) ($p<0.05$). SBRN showed increased values in longer stimulation duration (1000, 700, 500, 300, 200, 100, 70 msn) and DBUN showed increased values in all stimulation durations ($p<0.05$).

Conclusions: This finding could indicate a link between TMCOA and sensory changes extending beyond the directly affected joint and possibly involve the ulnar side of the wrist. Attributing this to secondary factors such as cutaneous fascial connections is intriguing and could have important implications for understanding the wider impact of a condition.

A-0645 DO ULNAR HEAD REPLACEMENTS LAST 20 YEARS? FINDINGS ON PROSTHESIS SURVIVAL AND CLINICAL OUTCOMES

Lukas Viktor Dirschedl, Jörg van Schoonhoven
RHÖN-KLINIKUM Campus Bad Neustadt, Clinic for Hand Surgery, Bad Neustadt an der Saale, Germany

Introduction: Evaluating prosthesis survival is essential for understanding its durability and clinical value. However, long-term data on niche implants like the Herbert Ulnar Head Prosthesis (UHP) are scarce, despite its critical role as a last resort for severe degenerative or post-traumatic distal radioulnar joint (DRUJ) arthrosis. This study provides crucial insights by assessing outcomes in patients with UHPs implanted over more than 20 years ago, offering valuable data to guide hand surgery practice

Aim: To assess 20-year outcomes of UHP implantation for DRUJ reconstruction, with a focus on prosthesis survival, wrist mobility, pain reduction, and patient-reported satisfaction.

Materials and Methods: A single-center prospective longitudinal cohort study with two follow-ups was conducted on patients who received UHPs between February 1996 and October 2004. Clinical assessments included wrist range of motion (ROM), grip strength measurements using a Jamar dynamometer, and pain scoring via the Numeric Rating Scale (NRS). Patient-reported outcomes were gathered through the DASH and PRWE questionnaires, while radiographic evaluations assessed prosthesis integrity. Survival and revision rates were tracked. Statistical analyses included paired t-tests with Holm-Bonferroni correction to control for multiple comparisons

Results: A total of 29 eligible patients were followed, with five deceased. The mean age at surgery was 43 ± 11.7 years. Follow-up rates were 74% at the first evaluation (12.8 ± 3.2 years post-op) and 50% at the second evaluation (24.8 ± 3.3 years post-op), with an overall UHP survival rate of 96.6%. Revisions were required in 17.2% (5/29) of cases, primarily due to luxation (6.9% requiring exchange, 3.4% necessitating explantation). ROM dimensions after more than 20 years were as follows: ulnar deviation 32.73° ± 17.94, radial deviation 14.09° ± 9.17, pronation 74.58° ± 9.41, and supination 65.83° ± 22.55, with no significant changes observed compared to preoperative values. Grip strength relative to the contralateral side improved significantly from 42.5% ± 27.4 to 70.2% ± 26.8 ($p = .007$). Pain scores decreased notably (NRS at rest: 8.17 ± 2.3 to 4.00 ± 2.5, $p = .002$; NRS during load: 9.08 ± 1.2 to 5.25 ± 3.0, $p = .003$). Although DASH scores improved from 68.0 ± 19.3 to 38.0 ± 35.8, this change was not statistically significant ($p = .160$). PRWE scores after more than 20 years averaged 35.5 ± 16.5. Notably, all patients surveyed at the second follow-up (12/12) indicated they would opt for UHP implantation again. No radiographic loosening was detected

Conclusions: The UHP provides a durable long-term solution for complex DRUJ pathologies, offering significant improvements in grip strength, and pain reduction, with high patient satisfaction maintained over more than 20 years. Importantly, ROM was preserved throughout the extended observation period. The prosthesis demonstrated a high survival rate and a low incidence of revisions, further underscoring its utility in challenging cases.

A-0646 POST-TRAUMATIC DIAPHYSEAL PSEUDOARTHROSIS IN A PEDIATRIC PATIENT: SURGICAL RESOLUTION WITH AUTOLOGOUS GRAFT AND PLATE STABILIZATION

Branly Parra Prieto, Marta Jamilà Casanova, Sergio Pino Soroche, Emilio Cañete Carril
Hospital Universitario de Terrassa, Barcelona, Spain

Introduction: Pseudoarthrosis of the radius and ulna is an uncommon but significant complication of diaphyseal fractures in pediatric patients. It requires a multidisciplinary approach, precise diagnosis, and tailored surgical management.
Case Description: An 8-year-old girl sustained a traumatic injury to her right forearm on March 10, 2022, after a fall. She presented with pain, functional limitation, and a confirmed diaphyseal fracture of the right radius and ulna on X-ray.
Initial Interventions: March 11, 2022: Closed reduction and fixation with Kirschner wires (K-wires) under general anesthesia. Immobilization was initiated with a dorsal brachial splint.
June 23, 2022:Surgical removal of K-wires due to a localized infection around the cubital pin site (hardware removal).
Clinical Evolution: Despite initial improvement, the patient experienced localized pain in the midshaft of the radius, with radiographic evidence of pseudoarthrosis and delayed consolidation. Further imaging studies ruled out infection.
Definitive Treatment: On March 16, 2023, definitive surgical treatment included resection of the pseudoarthrosis, stabilization with a locking compression plate (LCP, 2.7 mm), and autologous bone grafting from the ipsilateral iliac crest. The procedure was uneventful.
Follow-Up: April 3, 2023:First postoperative follow-up. The patient showed no pain, and the surgical site was healing well.
June 2, 2023: Advanced consolidation noted on X-ray, with near-complete healing. Use of the orthosis was limited to sports activities.
September 1, 2023: Complete consolidation confirmed. The patient returned to unrestricted activities.
Discharge: January 26, 2024: At 10 months post-surgery, with full recovery and no functional limitations, the patient was discharged.

Abstract
Background: Diaphyseal fractures of the radius and ulna in pediatric patients usually heal with conservative management. However, complications like pseudoarthrosis are rare and require complex surgical solutions.
Case Report: An 8-year-old girl presented with a diaphyseal fracture of the right radius and ulna due to trauma. Initial treatment involved closed reduction and K-wire fixation. Secondary complications led to localized infection around the hardware, necessitating removal. Despite initial improvement, pseudoarthrosis developed, confirmed by clinical symptoms and radiographic evidence.
Definitive treatment, performed 12 months post-injury, consisted of pseudoarthrosis resection, stabilization with a locking compression plate (2.7 mm), and autologous bone grafting from the iliac crest. Postoperative follow-up revealed progressive radiographic healing and functional recovery, with full bone consolidation achieved at 5 months. The patient resumed unrestricted activities and was discharged at 10 months post-surgery.
Conclusions: This case underscores the importance of timely recognition and management of pseudoarthrosis in pediatric patients. Autologous bone grafts combined with modern osteosynthesis techniques can achieve excellent outcomes in challenging cases.

A-0647 BIOPHYSICAL STIMULATION OF SCAPHOID FRACTURES: A RETROSPECTIVE STUDY

Carmine Scarlato[1], Nicoleta Denami[1], Andrea Ghezzi[2], Giorgio Pajardi[2], Macarena Vizcay[2]
[1]School of Specialization in Plastic, Reconstructive and Aesthetic Surgery – Milan University, Italy; [2]University Department of Hand Surgery & Rehabilitation - San Giuseppe Hospital - IRCCS MultiMedica Group Milan, Italy

Introduction: Scaphoid fractures are among the most common wrist injuries, particularly in young and active individuals. Due to the unique vascular anatomy of the scaphoid, which receives most of its blood supply from the distal pole, fractures are often associated with a high risk of complications, such as delayed union, nonunion, and avascular necrosis, especially when they involve the proximal pole. As a result, there has been growing interest in adjunctive therapies, such as biophysical stimulation, to improve fracture healing and reduce the incidence of complications.
Aim: This study aimed to amplify the existing evidence by evaluating the efficacy of biophysical stimulation in the surgical treatment of scaphoid fractures.
Material & Methods: This was a retrospective multicenter clinical study in Milan, Italy. The eligibility criteria were 18 years old patients that had been surgically treated in our department between January 2020 and December 2023 following an acute scaphoid fracture. The exclusion criteria included the addition of a further fracture or an associated soft tissue lesion. All patients were prescribed electromagnetic biophysical stimulation therapy during the postoperative period, and the device was used during the night. This therapy was administered for a total of 6 weeks. The patients were divided into two groups: those who received biophysical stimulation therapy (group A) and those who did not (group B).Demographic, imaging, radiological, and return-to-work data were obtained from medical records. In addition, the Patient-Rated Wrist Evaluation (PRWE) was administered via telephone. Student 's t-test was used to assess the associations between categorical variables and continuous variables. A P significance was set at $P < 0.05$.
Results: The study included 26 patients, divided into two groups: those who received biophysical stimulation therapy (group A, n=10) and those who did not (group B, n=16). The median age was 32 years for both groups, and all patients were men. The time between trauma and surgery was not significantly different between the groups. Radiographic consolidation was assessed at various time points post-surgery. The time between surgery and radiographic consolidation was significantly better in group A (55 vs. 83 days, P=0.024). The time between surgery and return to work was not significantly different between the groups. Quality of life, assessed using the PRWE, was not significantly different between the groups. However, the VAS score of pain showed a significant difference, with patients in group B experiencing more pain (0 vs. 0.47, P=0.048).
Conclusions: Electromagnetic biophysical stimulation promotes faster healing of scaphoid fractures and a postoperative course characterized by less pain, making it a promising additional treatment for patients without contraindications, particularly those with high functional demands.

A-0648 USE OF A BILOBED FASCIOCUTANEOUS FLAP IN A COMPLEX DEFECT WITH TENDINOMUSCULAR EXPOSURE IN THE FOREARM AFTER A DOG BITE. A CASE REPORT

Amer Mustafa-Gondolbeu[1,2], Anna Scott-Tennent de Rivas[1,3], Laura Prats Gispert[1,2], Marta Bonjorn Martí[1,2], Pau Forcada Calvet[1,2]
[1]Hospital Universitari Arnau de Vilanova, Lleida, Spain; [2]Faculty of Medicine, Universitat de Lleida, Spain; [3]Kaplan Institute, Barcelona, Spain

Introduction: Complex forearm bite wounds can be a challenge both in terms of functional reconstruction and in terms of ensuring correct coverage of the tissues.

Aim: We present the case of a 40-year-old woman who was attacked by a stray dog and injured on her right forearm with loss of skin tissue and extensive tendon and muscle involvement in the middle and dorsal region of the forearm.
Material & Methods: After primary surgery for cleaning and tendon reconstruction of the extensor tendons of the wrist and fingers and several subsequent cleaning surgeries, she presented a defect of coverage with tendinomuscular exposure in the union of the middle and proximal 1/3 of the dorsal forearm. A local fasciocutaneous flap of the bilobed type was chosen, providing sufficient coverage for the exposed area and primary closure without tension.
Results: After 6 months of rehabilitation, the hand and wrist recovered functionally, controlling the extension of the hand and fingers and maintaining correct skin coverage.
Conclusions: Multiple options exist to obtain good coverage of the forearm for wounds that expose the tendinomuscular plane. However, many of them involve complex surgeries such as the use of vascularised free flaps, with the associated morbidity that this sometimes entails. Therefore, we believe that knowing and managing local and rotational flaps can be an excellent alternative in many cases without requiring vascular microsurgery or compromising other anatomical areas.

A-0649 IS DELAYED SURGICAL TREATMENT OF DISTAL RADIUS FRACTURES INFERIOR TO DIRECT SURGICAL TREATMENT?

Sanne Smidt[1,2], Britt Barvelink[1,3], Joost Colaris[1], Max Reijman[1]
[1]Erasmus MC, Rotterdam, the Netherlands; [2]Reinier Haga Orthopedisch Centrum, Zoetermeer, the Netherlands; [3]Sint Franciscus Gasthuis, Rotterdam, the Netherlands

Introduction: Distal radius fractures (DRFs) are the most common fractures among adults, with increasing incidence over time. Treatment options of reduced DRFs include either cast immobilization or immediate surgical stabilization. More than half of well aligned fractures heal properly after reduction with non-operative treatment. Substantial overtreatment will be diminished if only patients with re-displaced DRFs in cast are treated surgically.
Aim: The aim of this study is to objectify whether surgical treatment within or after 7 days affects patient reported outcome in reduced distal radius fractures.
Material & Methods: This retrospective analysis utilized prospectively collected data from the CAST study, a multicenter cluster-randomized controlled trial conducted in the Netherlands. Adult patients (age >18) with displaced DRFs requiring closed reduction were included. We selected those patients who underwent direct (<8 days post-injury) or delayed surgical treatment (8-35 days post-injury) of their DRF. A linear mixed model was used to estimate differences in mean Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH) and Patient Rated Wrist/Hand Evaluation (PRWHE) scores during follow-up at 6 weeks, 3, 6 and 12 months.
Results: Out of 275 patients analyzed, 92 underwent direct surgery (mean 4.9 days post-injury, SD 1.6) and 183 underwent delayed surgery (mean 13.2 days post-injury, SD 3.7). Direct surgery resulted in significantly better PRWHE scores at 6 weeks with a between group difference of -6.3 (95% CI -12.2 to -0.5) and at 3 months with a between group difference of -5.7 (95% CI -11.2 to -0.1), but no significant differences were observed at 6 and 12 months. QuickDASH scores did not differ significantly between-groups at any time point
Conclusions: Direct surgical treatment offers short-term functional benefits at 6 weeks and 3 months post-injury compared to delayed surgery, but these differences did not reach clinically significant differences. Long-term functional outcomes at 6 and 12 months were not affected by the timing of surgery. Both direct and delayed surgical treatments are associated with similar complication rates. These findings suggest that it is safe to only perform surgery on re-displaced distal radius fractures without compromising the long-term patient outcomes. This approach could diminish surgery for DRFs with approximately 50%.

A-0650 COMPLEX REGIONAL PAIN SYNDROME FOLLOWING PLATE-FIXED DISTAL RADIUS FRACTURES: A RETROSPECTIVE ANALYSIS

Petra Hartmann, Petr Machac, László Faludi
Department of Traumatology and Orthopaedics, University of Szeged, Hungary

Introduction: Complex Regional Pain Syndrome (CRPS) is a recognized complication of distal radius fractures.
Aim: This study evaluates its incidence, resolution, and predictive factors in patients treated with plate osteosynthesis, without specific CRPS-targeted therapy.
Material & Methods: Patients with displaced, unstable fractures or comminution zones underwent volar plate fixation. Follow-up assessments were conducted at 6 weeks, 12 weeks, 6 months, and 1 year. Symptoms were evaluated in relation to adherence to a 12-week physiotherapy protocol (15 sessions plus home exercises) and the need for postoperative casting versus immediate mobilization.
Results: At 6 weeks, 30% of patients exhibited CRPS symptoms, which resolved in all patients by 1 year. Interestingly, on direct questioning, minor residual complaints, such as reduced cold tolerance, were reported by some patients at the 1-year follow-up. Symptom persistence showed no correlation with radiographic displacement. Predictive factors included adherence to physiotherapy by 6 weeks, completion of the rehabilitation program by 12 weeks, and achieving motion-stable fixation without postoperative casting.
Conclusions: While CRPS symptoms resolved within a year, minor residual issues were detected in certain patients. These findings highlight the importance of structured rehabilitation and achieving stable fixation to optimize outcomes.

A-0651 COSTS OF DISPLACED DISTAL RADIUS FRACTURES: NON-OPERATIVE TREATMENT VERSUS DIRECT AND DELAYED PLATE FIXATION. A COMPREHENSIVE COST ANALYSIS BASED ON THE CAST STUDY

Britt Barvelink[1], Stella CM Heemskerk[2], Sanne Smidt[1], Jan AN Verhaar[1], Max Reijman[1], Joost W Colaris[1], on behalf of the CAST study group
[1]*Department of Orthopaedics and Sports Medicine, Erasmus MC, University Medical Center Rotterdam, The Netherlands;*
[2]*Department of Public Health, Erasmus MC, University Medical Center Rotterdam, The Netherlands*

Aim: The aim of this study was to provide a comprehensive overview of costs and health-related quality of life associated with three treatment modalities for common displaced distal radius fractures (DRFs): 1) non-operative treatment, 2) direct plate fixation and 3) delayed plate fixation, when fracture redisplacement occurs during follow-up.
Methods: A cost analysis was performed based on data collected during the CAST study, a multicenter cluster-randomized controlled trial including adult patients with a displaced DRF, randomized between immobilization with a plaster splint or circumferential cast. Included patients were prospectively followed for one year. Operatively treated patients also continued questionnaire follow-up. Healthcare costs, patient and family costs, and indirect (i.e. productivity) costs were collected. Patients completed questionnaires on health-related quality of life (EQ-5D-5L), healthcare consumption and work absence.
Results: In total, 693 patients were included in this cost analysis (non-operative: 402, direct plate fixation: 165, delayed plate fixation: 126). The mean total costs per patient were €2172 for non-operative treatment, €4321 for direct plate fixation and €4601 for delayed plate fixation. Health-related quality of life improved in all groups up to one year after fracture sustainment. No clinically relevant differences in quality of life were observed between groups
Conclusions: Non-operative treatment is least costly. The cost differences between direct and delayed plate fixation are minimal and no clinically relevant differences in health-related quality of life exists between groups. Delayed plate fixation should be considered as a standalone treatment strategy, next to non-operative and direct surgical treatment.

A-0653 DE QUERVAIN TENDINOPATHY: ANATOMICAL VARIATIONS AND ASSOCIATION WITH CORTICOSTEROID INJECTION SUCCESS

Dimitrios Kitridis[1], Evangelos Perdikakis[2], Eleni Karagergou[3], Stavros Pellios[1], Panagiotis Givissis[3]
[1]1st Orthopaedic Department, 424 Army General Training Hospital, Thessaloniki, Greece; [2]Department of Radiology, 424 Army General Training Hospital, Thessaloniki, Greece; [3]Aristotle University of Thessaloniki, 1st Orthopaedic Department, School of Medicine, Faculty of Health Science, Thessaloniki, Greece

Introduction: Anatomic variations of the first extensor compartment seem to be a factor for both the process of de Quervain tenosynovitis and the recurrence after corticosteroid (CS) injections.
Aim: Our study had two purposes; identifying the anatomical prognostic indicators of symptoms recurrence following CS injection using ultrasound and determining the efficacy of a single injection for de Quervain tendinopathy.
Material & Methods: Fifty consecutive patients with de Quervain tendinopathy were treated with a single CS injection. All patients were assessed with ultrasound imaging of the first extensor tendon compartment of the wrist. The primary outcome was recurrence at either the six-week and six-month follow-up evaluations and the identification of the anatomical prognostic indicators of the recurrence. The Disabilities of the Arm, Shoulder, and Hand (DASH) score and the Visual Analogue Scale (VAS) for pain were evaluated as secondary outcomes, using the Wilcoxon signed ranks test.
Results: Fifteen patients (30%) had recurrence of symptoms within six-weeks. The intracompartmental septum and the number of tendon slips were predictive of symptom recurrence (adjusted odds ratio for the septum: 18.39, $p=0.045$; adjusted odds ratio for each additional tendon slip: 24.68, $p<0.01$). The presence of double groove, age, and gender were not predictive of injection failure. Overall, the injections had a successful outcome; the mean DASH score improved from 74.1 ± 5 to 19.3 ± 25.3 and the mean VAS for pain from 8.5 ± 0.8 to 2 ± 2.7 ($p<0.01$ for both scores). Five patients experienced minor adverse events with spontaneous improvement.
Conclusions: In de Quervain tendinopathy, the presence of intracompartmental septum and additional tendon slips in the first extensor compartment are prognostic for corticosteroid injection failure. Recognizing the prognostic factors influencing treatment success could help in counselling patients about the risk/benefit of CS injections. High possibility of recurrence will determine whether immediate surgical treatment of the disease is indicated, with the aim of avoiding an unnecessary cycle of conservative treatment along with its potential complications.

A-0655 CORRECTIVE OSTEOTOMY IN MALUNION OF DISTAL RADIUS FRACTURE USE OF CUSTOMIZED PLATES AND 3D: A CASE REPORT AND LITERATURE REVIEW

Branly Parra Prieto, Alejandro Pascual Broch Michavila, Berta Mir Cornellà, Sergio Pino Soroche, Emilio Cañete carril
Department of Orthopedic Surgery and Traumatology, Hospital Universitari de Terrassa, Barcelona, Spain

Introduction: Distal radius fractures remain among the most frequent fractures, accounting for approximately 12-17% of all fractures. One of the most common complications of these fractures is malunion, which can be either intra-articular or extra-articular. While non-surgical management (casting and immobilization) carries a higher risk of malunion (24%), the incidence decreases to around 11% with surgical intervention. Not all malunions are symptomatic, and not all bone deformities result in functional impairment. However, a malunion of the distal radius can lead to early osteoarthritis, reduced wrist function, and limited motion, especially in the distal radioulnar joint. The goal of corrective osteotomy in these cases is to restore joint congruency and alleviate symptoms.
Aim: This case report aims to present the clinical course and outcomes of a patient with a distal radius malunion, treated

with a corrective osteotomy. Additionally, we aim to review the current literature regarding the management of distal radius malunions and the efficacy of surgical correction.
Material & Methods: A 38-year-old male patient with a history of distal radius and ulna fracture, treated conservatively four years ago, was referred to our clinic with significant functional limitations. The patient's clinical and radiological assessments included physical examination, QuickDASH questionnaire, and radiographic imaging (X-rays and CT scan). Surgical planning involved preoperative 3D reconstruction to guide the osteotomy procedure. A corrective triple osteotomy was performed, which included a radial osteotomy with iliac crest bone graft, an ulna shortening osteotomy, and carpal ligament release.
Results: Postoperatively, the patient demonstrated significant functional improvement, with improved range of motion (pronation 90°, supination 45°, flexion-extension 50°/60°). Grip strength increased to 35 kg compared to 60 kg on the unaffected side. The QuickDASH score improved from 54.55% disability to 20.45%, reflecting a 34.10% improvement in overall function. Radiographs confirmed proper alignment and consolidation of the osteotomy. The patient eventually returned to work without any significant limitations.
Conclusions: Corrective osteotomy for malunion of distal radius fractures, aided by preoperative 3D planning and customized surgical plates, resulted in significant functional recovery in this patient. These techniques offer high precision in correcting deformities, improving patient outcomes. Early surgical intervention is recommended to prevent further complications such as early arthritis and functional impairment.

A-0656 SALVAGE OF THE CARPALMETACARPAL JOINT OF THE THUMB AFTER INADVERTENT CLOSED DISLOCATION

Amer Mustafa-Gondolbeu[1,2], Federico Garcia de Luis[1], Cesar Salamanca Ontiveros[1], Pau Forcada Calvet[1,2], Anna Scott-Tennent de Rivas[1,3], Marta Bonjorn Martí[1,2], Laura Prats Gispert[1,2]
[1]Hospital Universitari Arnau de Vilanova, Lleida, Spain; [2]Faculty of Medicine, Universitat de Lleida, Spain; [3]Kaplan Institute, Barcelona, Spain

Introduction: The stability of the thumb is essential for making the clamp and allowing functional use of the hand. For this it is necessary to have a stable and painless carpalmetacarpal joint.
Aim: We present the case of a 70-year-old man who was treated for a right tibial plateau fracture in two stages after a traffic accident (initial external fixator and subsequent definitive fixation after 2 weeks following improvement of the soft tissues in the area). On follow-up after discharge from hospital, after initial treatment and visits to the outpatient clinic, the patient reported discomfort in his right hand, which he had had since the day of the accident but had not mentioned until now and which, after using crutches in recent weeks, he had noticed was limiting him. On examination, he had swelling and deformity at the base of the first metacarpal, with little mobility at the focus and limitation for thumb mobility reaching Kapadji 5 with pain. Plain radiographs were taken, confirming dorsal carpalmetacarpal joint of the thumb.
Material & Methods: With the diagnosis 7 weeks after the initial trauma, open reduction of the limb under block anaesthesia and use of an ischaemia tourniquet was performed. An extended Gedda-Moberg approach was used, achieving reduction after removal of fibrotic tissue. Correct articular cartilage of both the metacarpal and trapezium was observed and the joint was saved by ligamentous reconstruction using the Eaton-Littler technique with a hemitendon of the flexor carpi radialis, obtaining optimal reduction and containment of the joint.
Results: The patient was kept in a fixed cast immobilisation with thumb locking for 6 weeks and 2 weeks of night splinting. Once a 6-month rehabilitation period had elapsed, the joint was stable, both clinically and radiologically, and pain-free on clamping, and Kapandji 9 was reached.

Conclusions: We consider it important to highlight the importance of preserving the joint in this patient, despite his advanced age, given the correct previous functionality and the absence of signs of joint degeneration. The use of classic capsular and ligament reconstruction techniques should be an option to be considered before envisaging palliative and irreversible treatments.

A-0657 ENHANCING CUP ALIGNMENT IN THUMB CMC ARTHROPLASTY: A NOVEL TWO-DEVICE SYSTEM FOR IMPROVED SURGICAL ACCURACY AND OUTCOMES

Benjamin Panzram[1], Simeon Daeschler[1,2], Sebastian Jäger[1], Jan Sommer[1], Leila Harhaus[3]
[1]Heidelberg University Hospital, Center for Orthopaedics, Heidelberg, Germany; [2]BG Trauma Center Ludwigshafen, Department for Hand, Plastic and Reconstructive, Surgery, Ludwigshafen, Germany; [3]BG Trauma Center Berlin, Department of Hand-, Replantation- and Microsurgery, Berlin, Germany

Introduction: Accurate cup placement in thumb carpometacarpal joint replacement, such as in the Touch® prosthesis for advanced arthritis, is essential for stability and function. The recommended method of cup placement relies on a central guidewire introduced under fluoroscopy that is removed before final cup impaction which can lead to malalignment, increasing the risk of instability and revision surgeries. In our research we could show a correctly inserted initial wire is no guarantee for a well-aligned cup.
Aim: To develop and evaluate a novel surgical tool designed to ensure consistent cup alignment and improve the accuracy of final cup placement in CMC arthroplasty.
Material & Methods: We developed a tool system consisting of two devices to address limitations in standard guidewire techniques. The first device is a combination of a trial cup and a tool to place an eccentric guidewire positioned outside the reamed cup, which provides a stable positional reference during cup placement and after removal of the initial guidewire placed under fluoroscopy. The second device is an impaction tool that aligns and impacts the final cup over the eccentric guidewire, maintaining orientation throughout the final placement. This system was tested on cadaveric models, and its performance was compared to traditional methods, assessing accuracy of alignment and ease of use.
Results: The developed tools demonstrated significant improvement in cup alignment accuracy, with reduced deviations from the ideal orientation. The continuous reference provided by the eccentric guidewire minimized misalignment during impaction. The system proved especially beneficial for less experienced surgeons, enhancing precision and reproducibility
Conclusions: This innovative two-device system, incorporating an eccentric guidewire, addresses the alignment challenges in thumb CMC arthroplasty. By maintaining an external reference throughout the procedure, the tool system reduces misalignment risk, potentially lowering revision rates and enhancing overall surgical outcomes. This advancement offers a valuable improvement in CMC prosthesis placement techniques.

A-0658 RADIOCAPITATE FUSION AS AN ALTERNATIVE TO THE TOTAL WRIST FUSION IN DEGENERATIVE AND POST TRAUMATIC WRIST ARTHRITIS

Martin Czinner[1,2,3], Radek Kebrle[1], Tereza Peterkova[1]
[1]Dr. Pírek'c Clinic, Mladá Boleslav, Czech Republic; [2]Regional Hospital Liberec, Czech Republic; [3]1st faculty of medicine, Charles University, Czech Republic

Introduction: Advanced degenerative and posttraumatic diseases of the wrist are frequently treated by total wrist fusion. Historically, the procedure fuses the distal radius, proximal row, distal row and metacarpals. A high number of complications

related to CMC nonunion, tendon irritation, need for bone grafting and plate removal have been described in the literature. Even though degeneration of radiocarpal and midcarpal joints is treated, many complications are related to the level of CMC joint, which is usually healthy. The development of locking plates allows a non-CMC crossing technique. Moreover, concomitant proximal row carpectomy - radiocapitate fusion can exclude the need for bone grafing and ease the union.
Aim: Material & Methods: The authors describe a group of 25 patients treated for primary degenerative wrist arthrosis, posttraumatic arthrosis and failed proximal row carpectomy.19 of these patients had previous surgical procedures performed before fusion for different diagnoses related to the wrist. Patients were followed on a regular basis at 2, 6 and 12 weeks radiologically.
Through the dorsal approach, after proximal row carpectomy, a direct fusion between radius and capitate was performed with preservation of the capitotrapezoid and capitohamate joint. A locking plate dedicated to radiocapitate fusion was used to stabilize the fusion. At the end of the procedure, morcelized bone from the proximal row was impacted as a bone graft into the radiocapitate area.
Results: Twenty-four patients healed primarily. Bony consolidation has been observed at 3 months in 20, four had a prolonged healing time variating between 4,5 and 6 months. One patient needed additional decortication and fixation to promote healing in postinfectious wrist arthrosis. Four other complications were observed. One patient developed secondary spontaneous CMC fusion, one patient developed carpal tunnel syndrome, and two patients had iritative screw malposition. Only three patients needed plate removal and no additional bone graft was necessary in the group. Motion in the CMC area and capitohamate joint has been preserved in all but one patient
Conclusions: Radiocapitate fusion with proximal row carpectomy, with preservation of CMC and capitohamate motion, proved to be a reliable procedure for preserving residual wrist motion in the transverse and longitudinal axes. This technique also reduces the number of complications historically related to wrist fusion.

A-0660 MIDTERM RESULTS AFTER REVISION SURGERY WITH A COSTOCHONDRAL AUTOGRAFT FOR SCAPHO-METACARPAL IMPINGEMENT FOLLOWING RESECTIONARTHROPLASTY OF THE THUMB CARPOMETACARPAL JOINT: A RETROSPECTIVE STUDY

Stefan Meuser, Johanna Ueberberg, Martin Richter
Department for Handsurgery, Helios Clinic, Bonn, Germany

Introduction: Osteoarthritis of the thumb carpometacarpal joint is one of the most common diseases in hand surgery. Before the development of dual mobility prothesis the resection arthroplasty (RAP) with or without ligament reconstruction and tendon interposition (LRTI) has been the therapeutic goldstandard for advanced conditions. A rare but severe complication is the proximalisation of the first ray with a resulting scapho-metacarpal impingement. Those cases have been treated by metacarpolysis and interposition of an autologous, costochondral graft.
Aim: To evaluate the clinical, radiological and functional outcomes after revision surgery for scapho-metacarpal impingement using an autologous, costochondral autograft.
Material & Methods: Patients who were treated between 2013 und 2023 with a costochondral autograft were examined. Clinical parametres were palmar- and radialabduction of the thumb and range of motion (ROM) of the wrist, pain on the visual analogue scale (VAS) and gripstrength. To measure the clinical function the quick disabilities of the arm, shoulder and hand score (quickDASH) and the brief Michigan hand questionnaire (bMHQ) were used. Donor side morbidity was evaluated with a separate score for rib fractures. Finally the postoperative results were categorized between good, fair and poor using the Connolly-Rath score.

Pre- and postoperative radiographs were examined for the scapho-metacarpal distance and the so called M1-M2 arch distance.
Results: From a total of 55 joints 42 were available for follow-up. The average palmar-/radialabduction of the thumb were 92 and 96 % and the range of motion of the wrist 94 % of the contralateral side. Pain levels improved from 9,2 during load and 7,2 during rest to 5,9 and 2,8 postoperatively. The average quickDASH was 47 and the bMHQ 52 resembling a moderate hand function. The overall donor side mobility was low. Only 5 (11,9 %) patients had minor problems at the donor side. In relation to the rating system proposed by Connolly and Rath 20 patients rated the result as good, 12 as fair and 10 as poor. The comparison between the pre- and postoperative radiographs regarding the scapho-metacarpal distance and the development of a midcarpal instability were contrary to the clinical parametres. Postoperative we observed a well improved radiographic measurements. Nevertheless at the time of final follow up most joints had subsided with scaphometacarpal distance and M1-M2 arch distance ranging around the preoperative measurements
Conclusions: Overall the interposition of a costochondral autograft for scaphometacarpal impingement following resection arthroplasty resembles an alternative option to other established methods. Though normal function could not be achieved an improvement of pain levels and clinical parametres could be observed. Contrary the initial postoperative improvement of the scaphometacarpal distance and M1-M2 arch distance decreased over the course of time. Nevertheless most patients were satisfied with the result and would choose the procedure again.

A-0661 TOTAL ELBOW ARTHROPLASTY AS A SALVAGE PROCEDURE FOR FAILED OSTEOSYNTHESIS OF AN ABANDONED SUPRACONDYLAR HUMERUS FRACTURE

Sergio Pino Sorroche, Branly Parra, Amalia Martínez Ruiz, Marta Jamilá Casanovas, Emilio Cañete Carril
Department of Orthopedic Surgery and Traumatology Hospital Universitario de Terrassa Barcelona, Spain

Case Report
Aim: This case presents a 76-year-old male with a history of right elbow trauma and sequelae from a distal humeral fracture in 2002, which led to significant functional impairment, pain, and joint degeneration. The patient underwent multiple interventions, and this report discusses his surgical management and eventual treatment with total elbow arthroplasty.
Material & Methods: The patient initially presented with a right elbow fracture (distal humeral fracture, paleta humeral) in 2002, requiring surgical fixation with a plate and screws. Postoperatively, the patient developed arthritic sequelae, including limited range of motion (30° to 95°) and moderate pain during physical effort. He also reported the presence of a loose screw and a peri-screw hygroma, along with paresthesia in the 5th finger.
A CT scan performed in 2020 showed a comminuted fracture with osteosynthesis material in place and a displaced screw located near the lateral epicondyle. There was also an olecranon swelling. An EMG performed in 2021 showed no signs of ulnar nerve injury. X-rays revealed the presence of loose screws and a Kirschner wire in the epitrochleo-olecraneal canal. In 2022, surgical intervention was planned for hardware removal, with the patient undergoing a procedure to remove the plate, medial screw, and Kirschner wire. A microbiological sample was also taken during surgery.
Results: Post-surgery, the wound healed well, and the patient's ulnar paresthesia gradually resolved. While his mobility remained limited, he was able to reach the top button of his shirt. X-rays confirmed the removal of all hardware, but also revealed total joint destruction. Despite improvement in some symptoms, the patient continued to experience pain and functional limitations, particularly after a fall three months later in 2024.
Clinical examination revealed complete instability in the right elbow with preserved flexion and extension, though strength was reduced. There was no motor or sensory deficit. Advanced radiographic changes indicated pseudarthrosis

of the humeral fracture with some displacement of fragments. A CT scan confirmed pseudarthrosis with significant displacement of the remaining humeral fragments, despite some preservation of joint form.
Based on these findings, a decision was made to proceed with a total elbow arthroplasty (TEA) to manage his ongoing symptoms
Conclusions: The patient's long-term elbow dysfunction, resulting from both malunion and secondary arthritis, required multiple interventions over the years. Despite hardware removal and conservative measures, the progression of joint destruction necessitated the decision for total elbow arthroplasty. This procedure provided the patient with significant pain relief, and early postoperative follow-up showed good functional recovery. Total elbow arthroplasty remains an effective treatment for severe joint degeneration in patients with a history of complex fractures and arthritis. The patient's ongoing recovery will be monitored over time.

A-0662 A 4-YEAR PROSPECTIVE OBSERVATIONAL STUDY ON THE DEVELOPMENT AND DISEASE-SPECIFIC CHARACTERISTICS OF DIABETIC HAND LESIONS

Madoka Higa[1], Michiro Yamamoto [1], Yayoi Kato [2], Jun Takeuchi [2]
[1]Department of Hand Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan; [2] Sapporo Diabetes and Thyroid Clinic, Sapporo, Japan

Introduction: Diabetes mellitus is considered an etiological factor of hand-related diseases, termed diabetic hand (DH), including limited joint mobility of finger(LJM), Dupuytren's contracture(DC), carpal tunnel syndrome(CTS), and trigger finger(TF).Most previous reports have been cross-sectional studies, and no prospective observational study have mentioned incidence. The purpose of this study is to examine the incidence of DH and the characteristics of each disease that constitutes DH by prospective observational study.
Materials and Methods: Japanese adults treated for diabetes at a single diabetes clinic from January 2019 to March 2019 were prospectively recruited for a 4-year observational study. Patient background (age, gender, BMI, diabetes type, HbA1c, duration of diabetes), presence of diabetic hand lesions at baseline and 4-year follow-up, patient-oriented quality of life assessment (EQ-5D), and hand function assessment (Hand10) were investigated. The incidence of DH was investigated and patient background, quality of life, and hand function by component disease were compared between patients who did not develop DH and those who did develop DH. Kruskal-Wallis test and Fiser's exact establishment test were used for statistical analysis
Results: At baseline, 262 patients (mean age 56.1 years, 159 males, 103 females, mean BMI 25.7, 22 type 1 diabetes, 240 type 2 diabetes, mean HbA1c 7.24%, mean disease duration 8.81 years) had no DH, and 69 patients had DH at 4-year follow-up (mean age 62.6 years, 43 males, 26 females, mean BMI 25.5, 5 with type 1 diabetes, 64 with type 2 diabetes, mean HbA1c 7.26%, mean disease duration 10.57 years), and the incidence of DH was 26.3%. By disease, 53 patients had LJM, 8 patients had TF, 3 patients had CTS, 5 patients had both LJM and TF and no patient had DC.Comparing the groups, patients with LJM were significantly older than those without DH (66.1 vs. 52.4 ; $p<0.01$), and had poorer hand function and quality of life at baseline (Hand10 : 10.1 vs. 2.08 ; $p=0.02$, EQ-5D : 0.851 vs. 0.936 ; $p<0.01$) and 4-year follow-up(Hand10 : 8.42 vs 1.74 ; $p<0.01$, EQ-5D : 0.849 vs. 0.938 ; $p<0.01$).
Discussion: Although this study included patients with good compliance who could be followed for 4 years while attending a diabetes clinic, many patients with LJM occurred over time, and these patients were older and had poorer hand function and QOL Score.Compared to the other three diseases, there is no clear treatment for LJM, and it is necessary to establish pharmacotherapy through clarification of the pathophysiology and to study the effectiveness of early hand range-of-motion training.

A-0663 INTRA-ARTICULAR OSTEOID OSTEOMA OF THE CAPITULUM: A DIAGNOSTIC CHALLENGE

Hooman Shariatzadeh, Mehrdad Bahrabadi, Shayan Amiri, Fatemeh Jahanshahi, Samad Joudi, Marjan Bahrabadi
Rasool-e-Akram Hospital, Department of Orthopaedic, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Here, we describe the first case of intra-articular osteoid osteoma of the capitu- lum, which is presented as elbow pain, extension lack, and sensation of click in joint flexion. Surgical treatment either arthroscopic or open is more in use in this location of the tumor than cortical osteoid osteoma.
Intra-articular osteoid osteoma is a diagnostic challenge, which needs more vigilance.
Surgical procedures either open or arthroscopy are en- couraged in intra-articular osteoid osteoma for obtaining tissue biopsy and treating osteoid osteoma.The RFA has some potential risks including long- lasting thermal damage to cartilage and bone. Therefore, it should never be used or be applied with extreme caution in intra-articular osteoid osteoma.

A-0666 DISTAL RADIUS FRACTURE NONUNION – CASE SERIES

Joana Correia Rodrigues, Cláudio Garcia, João Cruz, Tiago Canas, Rute Santos Pereira, André Cunha, Renato Soares, João Gonçalves, António Rebelo
Hospital do Divino Espírito Santo de Ponta Delgada, Ponta Delgada, Açores, Portugal

Introduction: Distal radius fractures are very frequent and usually result from a fall on an outstretched hand. Depending on fracture stability and the patient age and activity demands, treatment can be nonoperative or operative. Although rare, healing complications can occur, namely nonunion, which occurred in less than 1% of the fractures. Several factors related to the patient, the injury and the treatment may contribute for the development of distal radius nonunion. This complication is disabling and its treatment must be individualized.
Aim: to share a case series of distal radius fracture nonunion and the different treatment options used.
Material & Methods: Case 1: 69 years old female, with breast cancer undergoing chemotherapy, recurred to the Emergency Department (ED) after a fall which resulted in a right distal radius fracture with dorsal comminution. We performed closed reduction with a posterior plaster. After 2 weeks, on the reevaluation appointment she presented loss of reduction. Although, due to her low life expectancy, we opted to maintain the conservative treatment. During the rest of the follow-up period, she developed carpal tunnel compression symptoms and a fracture nonunion on the radiographies. She was very limited in her daily live activities. After she finished the chemotherapy, she underwent surgery: debridement of the fracture nonunion and placement of iliac crest autograft with a volar plate and carpal tunnel release. Case 2: 61 years old female, without relevant personal history, also recurred to the ED after a fall which resulted in a right distal radius fracture. We also performed nonoperative treatment with closed reduction with a posterior plaster, with no complications. She kept regular follow-up (2, 6 weeks, 3 and 5 months). During this period, she maintained pain complains and a fracture nonunion was radiologically confirmed. She underwent surgery: debridement of the fracture tops and fixation with a volar plate.
Results: Follow-up at 2, 6 weeks, 3, 6 and 12 months postoperative for both patients. The first patient stayed immobilized with posterior plaster for 2 weeks and after that she started physiotherapy with good results. The second patient started mobilization after the surgery and early physiotherapy, without a period of immobilization, with good results. At the last appointment, both of them had no pain, being able to perform every daily activity tasks. The first patient still has paresthesia on the tips of the first, second and third fingers.
Conclusions: Although rare, distal radius fracture nonunion, is associated with pain and limitations on daily activities. Its treatment is demanding and requires a careful and individual planning to avoid further complications.

A-0667 CHARACTERISTICS OF PATIENTS WITH WRIST AND HAND DISORDERS AND THEIR RELATIONSHIP WITH ANXIETY AND DEPRESSION LEVELS: PRELIMINARY RESULTS OF A CROSS-SECTIONAL STUDY

Yisha He[1], Patrick Krastman[1], Gerald Kraan[2,3], Nina Mathijssen[2,3], Rianne Oomen[2,3], Sita Bierma-Zeinstra[1], Jos Runhaar[1]
[1]Erasmus Medical Center, Rotterdam, The Netherlands; [2]Reinier de Graaf Groep, Delft, The Netherlands; [3]Reinier Haga Orthopedisch Centrum, Zoetermeer, The Netherlands

Introduction: Wrist and hand disorders are common and significantly affect patients' daily lives and overall well-being. Understanding the baseline characteristics of patients with these conditions, along with their associations with psychosocial factors like anxiety and depression, is essential for improving patient care and management strategies.
Aim: To describe the baseline characteristics of patients with wrist and hand disorders referred for imaging and to analyze the associations between these characteristics and levels of anxiety and depression.
Material & Methods: This study utilizes data from KLAP-Studie cohort, comprising patients aged 18 years or older who were referred to radiology department of Reinier de Graaf Gasthuis for wrist and/or hand complaints, with the cohort primarily aimed at investigating the association between these complaints and radiological imaging findings. RStudio was used to describe baseline data, which included general characteristics (age, sex, menopausal status, BMI, workload, whether dominant hand was affected, complaint duration, and trauma history), course and management (referral source and use of painkillers), and questionnaires (PRWHE, FCI, NPRS, HADS, PCS, SQUASH, and AUSCAN), and analyze correlations between these factors and HADS anxiety and depression scores.
Results: A total of 505 patients were included (missing data: 9-13%). The mean age was 58 years (SD15), and 63% were female, of which 49% postmenopausal. The mean BMI was 26(SD5). Workload was no physical work (34%), light (34%), moderate (23%), and heavy (9%). 57% had their dominant hand affected. The mean complaint duration was 33 weeks (SD88): 49% lasted 0-12 weeks, 34% for 12-52 weeks, and 16% over 52 weeks. Trauma history was noted in 54%. General practitioners (63%) were the most common referral source, followed by emergency physicians (11%), rheumatologists (10%), orthopaedic surgeons (9%), plastic surgeons (3%), trauma surgeons (1%), hand therapists (1%), and physiotherapists (1%). 28% of patients used painkillers, 76% of them used paracetamol (acetaminophen). The mean HADS anxiety score was 3.3 (SD3.2), with 13% classified as abnormal or borderline abnormal. The mean HADS depression score was 3.1 (SD3.1), with 18% classified as abnormal or borderline abnormal. The mean scores of other questionnaires were: PRWHE 45 (SD36), AUSCAN 21 (SD13), SQUASH 114 (SD85), PCS 9 (SD11), NPRS average 3 (SD2), NPRS worst 5 (SD3), and FCI 1.3 (SD1.8). Correlation analysis showed significant associations between anxiety scores and age (Spearman's rho=-0.12, p-value=0.02). Wilcoxon rank sum test showed that patients who used painkillers had significantly higher anxiety (mean anxiety score: users 4.3 vs. non-users 3.2, $p = 0.001$) and depression scores (mean depression score: users 5.3 vs. non-users 3.7, $p < 0.05$). Correlation analysis revealed significant associations between both anxiety and depression scores and the following questionnaire outcomes: FCI, NPRS, PCS, PRWHE, and AUSCAN, with all Spearman's rho > 0 and p-values < 0.05
Conclusions: Understanding the baseline characteristics of patients with wrist and hand disorders, along with their associations with anxiety and depression, has important clinical implications. Recognizing these associations can aid clinicians in assessing overall patient well-being. Identifying individuals at higher risk for psychological burden may inform future research on targeted interventions and mental health support to improve patient outcomes.

A-0668 FROM DEFORMITY TO FUNCTION: SURGICAL TREATMENT OF ARTHRITIS MUTILANS IN PSORIATIC ARTHRITIS WITH TOTAL CARPAL RESORPTION

Joana Santos Miranda, Catarina Pereira, Adriana Neves, João Valadas da Silva
Hospital Prof. Doutor Fernando Fonseca, Lisbon, Portugal

Introduction: Psoriatic arthritis (PsA) is a chronic inflammatory disease that can cause severe joint deformities, pain, and significant functional impairment. Advanced cases may exhibit extensive bone resorption, particularly in the hands and wrists, leading to joint instability and tendon ruptures. These complications pose challenges for both functional restoration and pain management, often requiring complex surgical interventions.
Clinical Case: We report the case of a 56-year-old male with a 20-year history of psoriatic arthritis. The patient presented to the orthopedic clinic with severe pain, deformity, and total dysfunction of his wrist and hand. Examination revealed ruptures in the extensor tendons of the 3rd and 4th fingers. Radiographs demonstrated complete resorption of the carpal bones and chronic dislocation of the first metacarpophalangeal joint.
Methods: A comprehensive surgical approach was chosen. Wrist arthrodesis with a dorsal plate was performed to stabilize the wrist. Additionally, a Darrach procedure was conducted to address ulnar-sided wrist issues. The first metacarpophalangeal (MCP) joint was stabilized using intramedullary interlocking screws. The common extensor tendons of the 2nd, 3rd, and 4th rays were repaired to their proximal segments to restore extension of the fingers.
Results: The surgery was completed without complications. Postoperatively, the patient was immobilized until evidence of successful arthrodesis was observed. Rehabilitation began after immobilization, resulting in improved hand stability, minimal pain, and good functional outcomes.
Discussion: This patient presented in the final and catastrophic phase of psoriatic arthritis, known as Arthritis Mutilans. This condition leads to debilitating functional loss and chronic pain. The surgical procedures employed provided a definitive solution, with multiple benefits for the patient. Wrist arthrodesis and stabilization of the first MCP joint addressed the structural instability, while tendon repair restored function by improving finger extension. This comprehensive approach not only corrected deformities but also eliminated the pain, ultimately enhancing the patient's quality of life and functionality. Advances in the design of more anatomically shaped arthrodesis plates—with wrist extension—have further enhanced the procedure, accommodating modern hand use in activities such as typing on a computer, using mobile phones, and driving. We also opted to use intramedullary nails on the first metacarpophalangeal joint to avoid further lesions of the soft tissues, such as the extensor apparatus. The combination of these procedures was essential in providing both structural and functional recovery, offering a long-term resolution to this severe and debilitating condition.
Conclusion: This case illustrates a rare, severe manifestation of psoriatic arthritis with extensive bone resorption and tendon rupture. This integrated surgical technique effectively addressed stability and pain, supporting its use as a viable option in similar cases.

A-0669 COMPLEX FOREARM INJURY: A RARE CASE OF TERRIBLE TRIAD WITH ESSEX-LOPRESTI LESION

Joana Santos Miranda, Catarina Pereira, Adriana Neves, João Valadas da Silva
Hospital Prof. Doutor Fernando Fonseca, Lisbon, Portugal

Introduction: The terrible triad of the elbow is a complex injury that presents significant challenges due to the instability it causes. When combined with an Essex-Lopresti lesion, characterized by radial head fracture, disruption of the interosseous membrane (IOM), and DRUJ instability, the management becomes even more complicated due to the risk of forearm

dysfunction and radial migration. The addition of a scaphoid fracture further increases the rarity and complexity of the case, requiring a comprehensive approach for stabilization and functional recovery.
Case Report: A 46-year-old male presented to the emergency department after a fall onto an outstretched arm. The patient reported a deformity of the elbow, which he managed to reduce himself. On examination, there was significant pain and swelling in the forearm, particularly over the distal radius and ulna. The patient also exhibited longitudinal and transversal instability of the forearm. Radiographic and advanced imaging revealed a comminuted radial head fracture, a tip of the coronoid process fracture, and a scaphoid fracture.
Methods: Given the complexity of the injury, a comprehensive surgical approach was selected. First, we reconstructed the IOM with a synthetic graft to restore forearm stability and prevent radial migration. Radial head arthroplasty was then performed, achieving stable alignment, which was confirmed intraoperatively. The lateral ligamentous complex of the elbow was repaired to restore stability. The DRUJ was tested, showing no additional instability, so no further fixation was needed. The scaphoid fracture was treated with percutaneous cannulated screw fixation to avoid prolonged immobilization of the wrist and facilitate early mobilization.
Results: Imaging at follow-up confirmed proper alignment and joint congruity, demonstrating the success of the procedures. The patient began a structured physiotherapy program soon after surgery, which focused on restoring range of motion (ROM) and strength in the elbow, forearm, and wrist. At three months post-operation, he had regained full ROM, showed no signs of joint instability, and reported minimal pain.
Discussion: The combination of a terrible triad injury with Essex-Lopresti lesion and scaphoid fracture is exceedingly rare, with few cases documented in current literature. This unique case highlights the challenges posed by multiple joint involvement and emphasizes the need for a comprehensive approach to ensure stability across the elbow, forearm, and wrist. The use of minimally invasive procedures, such as percutaneous fixation for the scaphoid and the synthetic graft for the IOM reconstruction, allowed for early mobilization and an enhanced rehabilitation process. This approach facilitated a faster recovery and reduced the risk of joint stiffness and dysfunction, aligning with current literature that advocates for early mobilization and functional restoration in complex multi-joint injuries.
Conclusion: This case exemplifies the rarity and complexity of a combined terrible triad, Essex-Lopresti injury, and scaphoid fracture, with global involvement of the elbow, forearm, and wrist. The comprehensive surgical approach, using minimally invasive techniques, proved highly effective in restoring joint stability and function. The case emphasizes the importance of a well-coordinated, minimally invasive surgical plan to optimize outcomes in complex, multi-joint injuries.

A-0671 NEW ONSET DUPUYTREN AFTER SURGICAL TREATMENT OF CARPAL TUNEL AND TRIGGER FINGER

R. Maroto-Rodríguez[1], M. Tibau Alberdi[1], M. Font Bilbeny[1], G. Paz[1], M. Gómez[1], A. Pérez Prieto[1], P. Barrera[2], M. Picallo[1], T. Chicaiza[2]

[1]Department of Hand and Wrist Surgery, Orthopaedic Surgery and Traumatology, Hospital de Mataró, Consorci Sanitari del Maresme (Barcelona) Spain; [2]Department of Phisiotherapy and Rehabilitation Hospital de Mataró, Consorci Sanitari del Maresme, Consorci Sanitari del Maresme (Barcelona) Spain

Introduction: This study examines the link between Dupuytren's disease and surgical treatment for carpal tunnel syndrome (CTS) and trigger finger (TF), two commonly performed hand procedures. Dupuytren's disease is a fibroproliferative condition of the palmar fascia, characterized by nodule and cord formation, leading to progressive finger contractures. Traditionally associated with genetic, environmental, and systemic factors, this study investigates its potential onset post-surgery and explores associated risk factors.

Aim: To evaluate the incidence of de novo Dupuytren's disease following CTS or TF surgery and identify potential risk factors, including comorbidities, occupational exposures, and surgical details.
Materials and Methods: This retrospective observational study analyzed 426 patients who underwent primary CTS or TF surgery at a single hospital. Inclusion criteria required no prior Dupuytren's diagnosis and a minimum of three months of postoperative follow-up. Data were collected on demographics, comorbidities (e.g., rheumatoid arthritis, diabetes), lifestyle habits (e.g., smoking), occupational exposures (e.g., manual labor, vibration), and surgical details (e.g., affected digits). Dupuytren's cases were graded using the Tubiana scale. Statistical analysis examined associations between Dupuytren's disease and patient or surgical factors. Ethical approval for the study was obtained.
Results: Among the 426 patients, 30 (7%) developed de novo Dupuytren's disease, with an average onset of 15.2 weeks after surgery. Most cases involved early-stage nodule formation (75.9%), primarily affecting the fourth digit (73.3%). Notably, none of the patients had a family history of Dupuytren's disease. Significant risk factors included rheumatoid arthritis (OR 3.24) and shoulder capsulitis (OR 9.7), alongside occupational factors such as manual labor and vibration exposure (OR 2.45). TF surgery patients were 2.3 times more likely to develop Dupuytren's disease compared to those undergoing CTS surgery, with the fourth digit being particularly at risk (OR 3.70). Other factors, such as sex, smoking, and diabetes mellitus, showed no significant association. Only 6.7% of affected patients required surgical intervention, and most cases remained stable without progression to severe contractures.
Conclusions: This study highlights a significant association between CTS/TF surgery and the subsequent development of Dupuytren's disease, especially among patients with rheumatoid arthritis, shoulder capsulitis, or occupational risk factors. The absence of family history among affected patients suggests that postoperative Dupuytren's may represent a distinct clinical variant rather than classic hereditary Dupuytren's disease. These findings underscore the importance of comprehensive preoperative assessments and vigilant postoperative monitoring to identify and manage palmar fibrosis early. Future studies should investigate the underlying pathophysiological mechanisms to clarify whether this constitutes a new Dupuytren's subtype.

A-0672 AXIAL MALROTATION OF MALUNITED DISTAL RADIUS FRACTURES

Grey Giddins[1], Alexander Hauser[2], Johannes Winker[2], Philip Maus
[1]Royal United Hospital, Bath, UK; [2]KLS Martin, Tutlingen, Germany

Introduction: Axial rotation of distal radial fractures is becoming more recognised. There have been very few publications. The incidence and magnitude of axial malrotation of distal radial fractures is not known
Aim: The aim was to assess the incidence and magnitude of axial malrotation of distal radius fractures (DRF) in association with conventional parameters of DRF malunion.
Methods: 50 sets of CT scans of the malunited and the contralateral normal wrist were compared from the database of KLS Martin available for cases of planned correction of fracture malunion. The anonymised data were assessed to measure the extent of the malunion. We measured conventional measures of shortening, dorsal angulation and loss of radial inclination. We also measured coronal, sagittal and axial angular displacement (malrotation). We compared these three parameters to see if there was any correlation.
Results: We measured 50 pairs of adult wrists i.e. the injured and uninjured sides in patients with distal radial malunion listed for surgery. The conventional parameters were:
Change in length (shortening) mean 4.2 (1.3 -6.7) mm
Change in dorsal angulation (sagittal) mean 310 (31-370) – volar angulation mean 14 (range 5-380)

Change in radial inclination (coronal) mean 12 (11-310)
Change in axial rotation – supination (40%) mean 120 (3-150); pronation (60%) mean 110 (1-190). In 17 (34%) the axial rotation was ≥ 150.
There was no obvious correlation between coronal, sagittal and axial malrotations.
Conclusion: Axial malrotation is as common as the more recognised changes in dorsal and radial inclination. In 1/3 of the cases the axial malrotation was ≥ 150. This may be significant in reducing forearm rotation and recognising it may improve correction and possibly outcomes in patients with distal radial fracture malunion.

A-0673 REPORT OF TWO CASES OF EXTENSOR POLLICIS LONGUS BONY ENTRAPMENT WITH DIFFERENT PATHOMECHANISM AND CLINICAL PRESENTATION DIAGNOSED BY ULTRASOUND

Agata Durdzinska Timoteo[1], Bérénice Moutinot[2], Sébastien Durand[1]
[1]CHUV, Lausanne, Switzerland; [2]HUG, Geneva, Switzerland

Introduction: Extensor pollicis longus rupture due to distal radius fracture is a well-known complication, with prevalence as high as 5% in non-displaced fractures and less than 1% in all fractures confounded. Another possible complication is the entrapment of this tendon. It is a rare condition, reported for the first time in 1969 by Hunt. Since then, few case reports and two retrospective studies were published
Aim: Describe two pathomechanisms of bony entrapment of extensor pollicis longus and diagnostic modalities by ultrasound, based on two clinical cases.
Material & Methods: The first case is a man who sustained a motorbike accident and presented a highly communitive, intra-articular distal radius fracture with palmar displacement (AO 23C3.2) and an open ulnar styloid fracture. He was operated and good reduction was obtained. Postoperatively he had swelling and difficulty in moving all fingers and thumb. At 4 months the first ultrasound was performed showing a continuous EPL tendon but a possible conflict with a bony prominence of the Lister tubercle. A second ultrasound was performed at 10 months showing a continuous EPL tendon passing in a bony tunnel at the site of Lister tubercle. Patient complained on discomfort in thumb flexion and impossibility to lift the thumb when wrist in extension. At 11 months he was operated for EPL tenolysis and hardware removal. The operative status confirmed the presence of a bony bridge at the site of Lister's tubercule over the EPL tendon. Interestingly, the walls of the bone tunnel appeared to be covered with some sort of synovial tissue, allowing the tendon to glide relatively well.
Second patient sustained a motorbike accident presenting at his left hand an extra-articular distal radius fracture with 100% palmar displacement, ulnar styloid fracture and 5th metacarpal fracture. At 6 weeks he complained about the limitation of thumb mobility. The tenodesis effect was preserved but there was no active thumb extension. An ultrasound showed the tendon at the distal ridge of the radius making a 90° curve and passing inside the bone, at the proximal part the EPL muscle was recognized by shear wave elastography during voluntary activation of the EPL and then traced distally where the tendon disappeared under the bone. The patient was operated 2 months after osteosynthesis and intraoperatively the tendon was found completely covered by bone over 3 cm length and 8 mm deep. The tendon was adherent to the bone and torn but continuous.
Results: In both cases the diagnosis was made using ultrasound and the operative findings were completely in line with the sonographic image. In the second case the elastography permitted to differentiate between entrapment and rupture. In both cases the tendons were transposed subcutaneously and the patients recovered completely.
Conclusions: The ultrasound is a good and reliable tool for diagnosis of tendinous entrapment. The elastography is a

precious tool helping in differentiating of rupture and tethering. The EPL tendon might get entrapped either during the reduction or by the bony callus formation over the tendon.

A-0674 OUTCOMES OF SHOULDER RELEASE SURGERY FOR CONTRACTURE IN PATIENTS WITH UPPER LIMB SPASTICITY – A RETROSPECTIVE REVIEW OF 26 CASES

S Abas, A Jha, E Lewis-Smedley, L Nugent, SJ Pickard
The Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, UK

Introduction: Over 80% of patients with non-progressive lesions to the central nervous system(CNS), have some degree of spasticity once the original disturbance has receded. Severe spasticity results in significant functional limitation and reduces quality of life for these patients, as well as driving pain phenomena, and having significant impact on their mental health. Spasticity typically results in the upper limb adopting a posture of shoulder adduction, arm internal rotation, forearm pronation, and elbow, wrist and finger flexion. For these patients, releasing the contractures of the shoulder surgically may improve range of movement, facilitating care, comfort and cosmesis in the upper limb.
Aim: In our cohort of patients with upper limb spasticity, we aimed to evaluate the efficacy of shoulder release surgery in improving the range of movement in patients with spasticity of the upper limb and the rate of recurrence with time. We also aimed to report on functional improvement and potential complications.
Material & Methods: Retrospective review of 26 patients presenting to our tertiary unit, who had undergone surgery for adducted, internally rotated shoulders secondary to spasticity, was carried out. Patients were operated on between 2011 and 2024. Patient demographic data, including their CNS injury characteristics and data on range of motion(ROM) was collected pre-operatively and at 6 weeks to 3 months post-operatively. Our primary outcomes were range of shoulder abduction, forward flexion and external rotation.
Results: Shoulder surgery comprised 11% of all spasticity surgeries performed during the review period in our unit. The diagnosis was cerebro-vascular accident(38%) and then traumatic brain injury(27%), spinal cord injury(15%) cerebral palsy(12%) and multiple sclerosis(8%) patients. The average age was 50 years. Muscles released were pectoralis major(100%), subscapularis(89%), conjoined tendon(58%) pectoralis minor(21%) and latissimus dorsi(16%). 85% had simultaneous surgery at other levels (80% elbow, 17% forearm), 32% had subsequent distal surgery and 1 patient had further shoulder surgery. All patients had range of movement assessed pre-operatively and post-operatively. Average follow-up was 27.9 months (range 1.5-156). The commonest procedure performed for shoulder spasticity was open release of the shoulder(80%). Pre-operatively the median (interquartile range[IQR]) ROM of the shoulder were: 75° forward flexion (IQR 38.75°), 0° external rotation (IQR 7.5°) and 80° abduction (IQR 22.5°). Post-operatively these improved to 120° forward flexion (IQR 45°), 40° external rotation (IQR 20°) and 90° abduction (IQR 30°). At subsequent follow-up these measures demonstrated sustained improvement in abduction (median 90° [IQR 5°]), some reduction in forward flexion (median 85° [IQR 32.5°]) and some reduction in external rotation (median 20° [IQR 20°]) however these remained improved compared to post-operatively. No major complications were reported. All patients reported a significant positive impact on their quality of life after surgery during follow-up. At the time of this review 16% of patients had died.
Conclusions: Shoulder release surgery in patients with fixed CNS lesions is effective in significantly improving range of movement to a functional level and enhancing quality of life, by improving mobility in the upper limb. Further observation is required to examine whether these effects are sustained long-term.

A-0675 WRIST LIGAMENT SURGERIES: NATIONWIDE INCIDENCE IN A 25-YEAR FOLLOW-UP

Annele M Ponkko[1], Antti K Kaivorinne[2], Ville M Mattila[2,3], Aleksi R Reito[2,4], Mikko P Räisänen[3,5]
[1]Department of Hand surgery and Orthopaedics, Oulu University Hospital, Oulu, Finland; [2]Division of Musculoskeletal Diseases, Tampere University Hospital, Tampere, Finland; [3]Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland; [4]Coxa Hospital for Joint Replacement, Tampere, Finland; [5]Department of Orthopaedics, Traumatology and Hand surgery, Kuopio University Hospital, Kuopio, Finland

Abstract: Wrist ligament surgeries are common procedures, but there is a lack of knowledge of their incidences and trends. This study is a retrospective registry study aimed at investigating nationwide incidence of wrist ligament surgeries from 1997 to 2021, in Finland. The data was retrieved from national electronic registry, the Finnish National Hospital Discharge Register (NHDR).
Our study detected twenty-threefold increase in traumatic wrist ligament surgery incidence from 1997 to 2014 (from 0.48 to 11.4), followed by a steep decrease to one-third (from 11.4 to 4.0) between 2014 and 2021. The incidence of arthroscopic procedures was over twofold compared to open procedures. In 2013, the incidence of arthroscopic procedures peaked, with arthroscopic procedures being performed over four times more frequently than open ones.
The precise reasons for the observed rise and subsequent decline remain unknown, but factors such as advancements in imaging, equipment availability, development of surgical techniques, long and demanding learning curve for arthroscopic procedures, industry influences, scientific publications, and a larger proportion of young hand surgeons in Finland, may have played a role.

A-0676 OSTEOCHONDROMA IN THE FOREARM IN CHILDREN WITH HEREDITARY MULTIPLE OSTEOCHONDROMA, WAIT FOR SYMPTOMS OR PERFORM PROPHYLACTIC SURGERY?

Katleen Libberecht[1,2], Ida Neergård Sletten[3], May Tove Hestmo[3], Per Hessman[1], Anders Björkman[1,2]
[1]Department of Hand Surgery, Sahlgrenska University Hospital, Mölndal, Sweden; [2]Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Sweden; [3]Division of Orthopedic Surgery, Oslo University Hospital, Norway

Introduction: The forearm is a common location for osteochondroma in patients with hereditary multiple osteochondroma (HMO). They can lead to diminished forearm rotation, growth disturbance and radial head dislocation. There are two main treatment strategies. The traditional being conservative until the child has complaints of limited rotation, pain or imminent radial head dislocation. The other is an early prophylactic excision of osteochondroma suspected of affecting growth in the distal ulna, even prior to the development of symptoms.
Aim: The aim of this study was to compare the outcome of two different treatment strategies.
Material & Methods: A double cohort study was done in two different university hospitals, where different strategies have been employed during the past 20 years. All patients born between 1996 and 2006 (at least 16 years old at follow-up) and with an osteochondroma in at least one distal ulna were invited to participate. We measured range of motion and strength, and patients filled out the QuickDASH, PRWE and EQ-5D-5L questionnaires.
Results: In the conservative group (C), 17 patients were included with osteochondroma in the distal ulna in 25 arms. In the prophylactic surgery group (P), 25 patients were included with 41 affected arms. Thirty arms in P underwent an excision of osteochondroma and no distraction lengthening procedures were done. In C, six ulnar distraction lengthenings were done and six excisions of osteochondroma. Luxation or subluxation of the proximal radius occurred in 4 arms in P (10%) and 5 arms in C (20%). The median QuickDASH was 4.6 (IQR 0-14,8) vs 11,4 (IQR 9,1-38,6) for P and C respectively

(p=0,013). The median PRWE was 3,0 (IQR 0,3-8,9) vs 16,0 (IQR 4,5-29,0) for P and C respectively (p=0,054). There were no significant differences in range of motion between the groups. There was a significantly better grip strength and key pinch in the P group.
The patients with a dislocated proximal radius had a higher QuickDash score (median 25,0 vs 5,7, p=0,025). The patients who underwent an ulnar distraction lengthening (n=6) had significantly higher QuickDASH (40,5 vs 10,5, p<0,001) and PRWE (38,5 vs 10,0, p=0,004). Three out of six distraction patients still had a proximal radius subluxation at skeletal maturity
Conclusions: This study showed that patients with HMO with a radial head subluxation or dislocation have a significantly worse patient-rated outcome than those without. In developing treatment strategies, the primary aim should be to prevent dislocation. Our results suggest that early excision of osteochondroma in the distal ulna can decrease the risk for radial head dislocation. A distraction lengthening of the ulna does not improve the clinical outcome of patients with imminent radial head dislocation. We recommend screening radiographs of the forearms in children with HMO. An osteochondroma in the distal ulna that causes a growth discrepancy between radius and ulna should be removed before it becomes symptomatic.

A-0677 RESCUE SURGERY FOR DISTAL RIGHT HUMERAL DIAPHYSEAL FRACTURE (PERI-IMPLANT) DUE TO PSEUDOARTHROSIS

Branly Parra Prieto, Sergio Pino Sorroche, Fracesco Antonio Ambrosini, Ferrán Gámez Baños, Emilio Cañete Carril
Hospital Universitario de Terrassa, Barcelona, Spain

Introduction: A 47-year-old female presented with a complex right humeral diaphyseal fracture with a third fragment and associated radial nerve neuroapraxia. This case involves a delayed recovery due to complications such as pseudoarthrosis and the need for multiple surgical interventions.
Aim: To describe the clinical course, surgical treatment, and rehabilitation of a right humeral diaphyseal fracture with associated radial nerve neuroapraxia and pseudoarthrosis.
Materials & Methods: The patient initially underwent surgery involving the placement of an intramedullary nail and screws for fracture fixation. Postoperatively, the patient experienced complications including radial nerve injury and pseudoarthrosis, requiring further surgeries. Follow-up involved radiological assessments, physical examinations, electromyography, and rehabilitation.
Results: After the initial surgery, the patient showed progress but developed complications such as radial nerve neurotmesis and a non-union fracture. Subsequent surgeries, including the placement of two long VariAx2 plates, were performed. Rehabilitation progressed slowly, with significant improvements in elbow and shoulder mobility over time. As of the latest follow-up, the patient showed signs of consolidation and function improvement, but some residual stiffness and pain persisted, particularly in the shoulder.
Conclusions: This case highlights the complexity of treating humeral fractures with nerve involvement and the challenges associated with pseudoarthrosis. Timely intervention and rehabilitation are crucial for optimal recovery, although some residual disability may persist, requiring long-term follow-up and functional rehabilitation.

A-0678 BRACHIALIS TO FLEXOR CARPI RADIALIS AND PRONATOR NERVE TRANSFER AS A TOOL IN THE RESTORATION OF UPPER LIMB FUNCTION IN PATIENTS WITH CERVICAL SPINAL CORD INJURY. AN ANATOMICAL STUDY AND DESCRIPTION OF A NOVEL TECHNIQUE

Sameera Abas[1], Simon Pickard[1], Nadine Sturbois-Nachef[2]
[1]The Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, UK; [2]Institut de la main, Paris, France

Introduction: In patients with cervical spinal cord injury, restoration of upper limb function is their highest priority (Anderson 2004). Classically, restoration of upper limb function in these patients has primarily focused on optimizing the balance of the muscles controlling elbow flexion and extension, and flexion/extension of the fingers required for grasping and releasing objects. Conventional tendon transfers aim to restore these, but while these primarily provide some restoration of hand grip, currently no techniques are described for the optimization of pronation/supination, which is crucial to enable better hand positioning and hence, the use of adaptive equipment and tools necessary for activities of daily living furthermore active wrist flexion enhances hand opening.

Aim: We describe a novel technique for regaining pronation , the transfer of terminal branch motor innervation to brachialis (Br), to the median nerve branches to (PT) and flexor carpi radialis (FCR), in patients with cervical spinal cord injury, and review this technique in a series of patients our centre. The brachialis muscle has a reliable, easily located, isolated motor innervation from the musculocutaneous nerve, which, when its intra- muscular length is included has a suitably long excursion, making it a candidate for transfer to the forearm for restoring prono-supination and wrist flexion.

Material & Methods: 5 cadaveric arms were dissected to measure the intramuscular segment of the terminal branch to the nerve to brachialis . Mean distance from the entry point of the nerve into the muscle to the end of the distal branch was 6 cm (4.2-8.1). In four cadavers an independent fascicle containing nerve fibers originating from FCR and PT and in one FCR, PT and FDS could be mobilised proximaaly to anastomose with the donor nerve from Br without graft.

3 patients have undergone this surgical technique as part of a package of surgery. The distal branch to Br within brachialis measured 6.1mm (7.9, 6.1, 4.2) and measured 1.7 mm diameter. All three were anastamosed directly onto the FCR/PT fascicle which had been dissected out of the median nerve

Conclusions: In the patient with tetraplegia, nerve transfers for the upper limb have risen in popularity, particularly supinator to posterior interosseous nerve however transfers into the median nerve in the arm used with caution in the restoration of hand function due to the associated risk of sensory disturbance and unreliable recovery profile; however, we have reliably demonstrated a safe and effective motor nerve transfer for the restoration of prono-supination in a subgroup of patients for which is function is vital for hand pre-positioning. The brachialis transfer technique, using intramuscular disection of the donor nerve provides advantageous nerve excursion, has the potential to reinnervate FCR and PT in the patient with cervical spinal cord injury, this improving other crucial functions for hand positioning.

A-0679 EARLY OUTCOMES OF THE USE OF POLYETHYLENE ON METAL ARTICULATION WRIST ARTHROPLASTY

Francesca Hill, Rami Estfan, Greg Packer
Southend University Hospital, Westcliff on Sea, UK

Introduction: Wrist arthritis is a debilitating condition having a significant impact on a patients day to day life. While options such as fusion and proximal row carpectomy offer adequate pain relief, functional outcomes are often reduced. Arthroplasty offers patients a viable option for pain relief while maintaining excellent ranges of motion with the aims of increasing their quality of life, both in self care and in activities.

Aim: In recent years design for wrist arthroplasty have been constantly evolving to improve outcomes and combat the most frequent complications and sources of failure. Due to the improvements in design and outcome, wrist arthroplasty is becoming an increasingly popular treatment option. In this cohort of patients, we are looking at a new generation introducing highly cross linked polyethylene (PE) cup on metal as an alternative articulating surface. PE has been widely used in major joint arthroplasty throughout the world and there is the benefit of long term studies proving excellent wear properties and implant longevity. It is logical to attempt to apply this tried and tested technology in wrist arthroplasty.
Material & Methods: Our retrospective data includes 50 cases of the PE articulating Motec wrist replacement with an average 2 year follow up in a two surgeon centre. The new articulation has been introduced into a unit very familiar with the Motec design thus reducing any complications and failures associated with the known learning curve of a new implant. Evaluation with the operating surgeon and hand therapists enabled us to collect a dash questionnaire assessment, patient evaluation Measure (PEM) in addition to visual analogue scale for pain assessment (VAS). Post operative X-rays were performed at 6 weeks assess for successful integration of the implant. If wounds are healed and patients are moving freely, they are discharged to the ongoing care of the hand therapists. Late post operative complications can then be referred back to the operating surgeon as required.
Results: Patients show a significant improvement in functional outcomes and pain relief following their replacement. Inflammatory arthropathies show a similar rate of post operative complications to other forms of articulation currently being used on the market. No new complications have been discovered that had not been previously seen with other forms of articulations.
Conclusions: This cohort of patients shows that the PE articulation is a viable alternative to PEEK and cobalt chromium articulations that are currently used for wrist arthroplasty. Longer term studies will need to be performed to evaluate implant longevity and modes of failure. Then ultimately comparison studies between articulation types could help determine a best single solution. PEEK vs CoCr have been reviewed frequently in the past, with PEEK showing significant benefits over CoCr. The hope is that PE on metal show a similar outcome to that of the PEEK on metal.

A-0680 A STUDY OF CHARACTERISTIC FEATURES AND DIAGNOSTIC ROLES OF X-RAY AND MRI IN CALCIFYING TENDINITIS OF THE SHOULDER

Morteza Nakhaie Amroodi, Shadi Abdolahi Kordkandi, Mehdi Moghtadaei, Hossein Farahini, Shayan Amiri, Mikaiel Hajializade
Shohadaye Haftom-e-Tir Hospital, Department of Orthopaedic, school of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background: Calcifying tendinitis (CT) is an enigmatic lesion with several obscure aspects and it is a common disorder of the upper extremity characterized by the presence of calcifications in rotator cuff tendons and synovial tissues. In this study, we aimed to review the demographic and clinical characteristics, as well as radiologic and treatment history in CT patients who were referred with shoulder pain.
Methods: In this cross-sectional study, a total of 146 patients who were referred with a shoulder CT were included. The definitive diagnosis was based on a combination of plain radiograph and magnetic resonance imaging (MRI). A predesigned independent t test was used to capture demographic and clinical data, as well as radiologic and treatment histories, and a chi-square test was utilized to assess the statistical correlation between qualitative variables
Results: The median age of the patients was 42.5 years. The female to male ratio was 2.3 to 1. The complaint of restricted shoulder movement was recorded in 107 (73.3%) patients and more frequently in women ($p = 0.042$). Night pain was

present in 109 (74.7%) patients. The current and previous diagnoses matched in 36.1% (13 out of 36) of patients who only had MRI and in 63.6% (35 out of 55) patients who had both MRI and plain radiograph with them. Supraspinatus tendon was the main site of calcified deposition 65% (95 out of 146).
Conclusion: CT is frequent at the age of around 40 and in the female gender. The diagnosis should be based on a combination of radiography and MRI and not based on MRI alone. The efficacy of different conservative treatments remains to be unwrapped.

A-0681 SHORT-TERM COMPLICATIONS OF OPEN LATARJET PROCEDURE FOR RECURRENT ANTERIOR SHOULDER DISLOCATION

Amir Sobhani, Seyed Nima Taheri, Shayan Amiri
Shohadaye Haftom-e-Tir Hospital, Department of Orthopaedic, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Background: Anterior dislocation is the most common type of shoulder dislocation, and even after appropriate treatment, recurrence after a primary traumatic anterior dislocation is highly frequent. Surgical options for treating recurrent anterior dislocations mainly include Bankart arthroscopic and Latarjet open surgery. We aimed to evaluate the outcomes and complication rates of the open Latarjet procedure in a series of patients with recurrent anterior shoulder dislocation.
Methods: A total of 55 patients with recurrent anterior shoulder dislocation who underwent an open Latarjet procedure were included in this retrospective cohort study. Shoulder range of motion and postoperative complications, including neurapraxia, re-dislocation, hematoma, infection, dehiscence, implant failure, and pain, were evaluated
Results: The mean age of the patients was 27.7 $\pm$ 6.5 years. The mean time interval after the first dislocation was 3.4 $\pm$ 2.7 years. The mean preoperative and postoperative forward flexion ($P = 0.200$), abduction ($P = 0.200$), external rotation ($P = 0.066$), and internal rotation ($P = 0.310$) were not significantly different. Postoperative complications included 1 case of postoperative musculocutaneous nerve neurapraxia, 1 case of re-dislocation, 1 case of wound dehiscence, and 2 cases of screw breakage. Postoperative pain was also recorded in 11 (20%) patients that were either in the form of occasional night pain ($n = 6$) or activity-dependent pain ($n = 5$).
Conclusion: Open Latarjet procedure is an efficient procedure for the treatment of recurrent anterior shoulder dislocation. However, its rate of complications remains relatively high, and surgeons must consider this drawback in their decision-making and address patients' expectations.

A-0682 DORSAL WRIST APPROACH THROUGH THE FRACTURE – FERNANDEZ TYPE 4 INJURIES

Balazs Lenkei, Adrienn Lakatos
BAZ County Teaching Hospital, Hungary

Introduction: Fernandez type 4 injuries of the wrist are rare fracture patterns. The dorsal dislocation of the wrist generally happens in a socket underneath the periosteum of the distal radius. The small bony fragments show the original attachment of the ligaments of the radius. This fracture pattern often comes together with an SL ligament injury, as Fernandez described in the original description.
Aim: In our series of such kind of injuries we used a dorsal approach, double plating as it has been suggested many times in the literatur. During the approach, the elevation of the dorsal joint capsule flap can be done in many different ways.

In our series we used a special technique. The transverse incision is done 1,5 cm proximal to the dorsal bony fragments, and incision can be extended following the fibers of the radio-triquetral ligament. This technique provides us with a wide window to the joint. Concomittant ligament injuries can be easily addressed. The fracture and the articular surface can reduced. The dorsal bony fragments can be easily puhed down by an L-shaped plate.
Material & Methods: In our series of 5 cases, we would like to introduce the technique, and the results that can be achieved with it.
Results: The surgical steps, and the results are documented with x-ray series and clinical videos.
Conclusions: According to our good clinical outcome, we would like to suggest thist type of approach of such fracture patterns.

A-0683 SALVAGE EMERGENCY EXIT AFTER FAILED TRAPEZIECTOMY LRTI

Adam Domanasiewicz[1], Jacek Martynkiewicz[1], Jerzy Gosk[2]
[1]Provincial Specialist Hospital Dept of Orthopedics, Trauma, Hand and Reconstructive Surgery Wrocław, Poland; [2]Faculty of Medicine Wrocław University of Science and Technology, Poland

Introduction: Degenerative changes of the metacarpophalangeal joint (CMC OA) are currently successfully treated with joint arthroplasty, trapeziectomy or arthrodesis. In cases of failed arthroplasty, trapeziectomy is the obvious choice. There are few solutions in the literature for cases of failed trapezectomy, with most addressing the problem of proximal migration of the 1st metacarpal bone. In cases of recurrent pollex adductus with thumb adductor muscle contracture, the recommended revision surgeries fail.
Aim: The authors present a method of stabilization of the metacarpal bone and correction of MCP joint hyperextension with dysfunctional thumb deformity (Z-thumb), after several unsuccessful revision surgeries with recurrent adduction of the 1st metacarpal bone
Material & Methods: The patient I. 48 arrived in 2017 for rhizarthrosis III/IV gr. according to Eaton, trapeziectomy LRTI with suspensionplasty APL, after a short period of improvement there was a recurrence of the deformity with adduction of the 1st metacarpal bone. Subsequently, in 2018 - 2020, she underwent 2 revision surgeries combined with repeat suspensionplasty with an ECRL slip and partial intermetacarpal arthrodesis. Both surgeries were complicated by recurrence of the deformity and thumb hyperextention. The authors used as a last resort the procedure used in unrepairable median nerve injuries to create opposition and abduction of the thumb with a bone block graft interposed between the 1st and 2nd metacarpal bones according to Fritschi
Results: The patient regained anatomical alignment of the thumb in all joints, significant improvement in hand function and grip strength (2.5x).
Conclusions: Complications in the functional range of a properly performed trapeziectomy with any LRTI suspensionplasty are rarer than with arthroplasty, and a satisfactory functional outcome is maintained for many years. In cases of failed trapezectomy, the problem is usually proximal migration of the 1st metacarpal bone and conflict with the scaphoid. In the qualification for trapeziectomy, advanced deformities with long-standing adduction of the pollex adductus type and hyperextention in the MCP , should be approached with caution, choosing primary CMC arthrodesis rather than trapeziectomy. For rhizarthrosis of the IV grade with associated ST arthrosis or recurrent deformity, the authors suggest intermetacarpal arthrodesis (bone block) with interposition of the bone graft in opposition and adduction of the 1st metacarpal.

A-0684 DOUBLE SCREW FIXATION IN THE SURGICAL REPAIR OF UNSTABLE SCAPHOID FRACTURES: COMPARISON WITH TWO COMMON BONE GRAFT AND FIXATION TECHNIQUES

Carsten Surke[1], Phoebe del Rosario[2], Lachlan Huntington[2], Eugene Ek[3], Stephen Tham[4], David Ackland[2]
[1]Aleris Hand och Fot, Stockholm, Sweden; [2]Department of Biomedical Engineering, The University of Melbourne, VIC, Australia; [3]Melbourne Orthopaedic Group, VIC, Australia; [4]Department of Surgery, Monash University, VIC, Australia

Introduction: Single headless compression screw fixation is the gold standard fixation technique for the treatment of the displaced fractured scaphoid, but rotational instability is an important factor contributing to non-union in patients with scaphoid waist fractures. Unstable scaphoid fractures are usually treated with a combination of bone graft and compression screw, with double screw osteosynthesis having been shown to result in high resistance to bending. Although technically more demanding than single screw fixation, double screw fixation may also improve rotational strength and reduce the overall stress at the screw-bone interface, thus improving construct resistance to higher loads. However, the rotational and bending stability of these techniques remain poorly understood.
Aim: The purpose of this study was to measure and compare the torsional and cantilever strength of double screw fixation to the single screw with a strut, or single screw with a wedge graft during bending or torsion loads.
Material & Methods: Forty-eight embalmed human scaphoids were harvested from cadavers (mean age: 83.5 years). Computed Tomography (CT) scans of each specimen were taken, and custom 3D printed cutting guides developed to create a standardised unstable fracture via a 3mm volar open wedge-shaped osseous defect at the scaphoid waist. Specimens were randomly allocated to one of three treatment groups: single screw and strut graft repair, single screw and wedge graft repair and double screw repair. Each surgery was undertaken using custom 3D printed cutting and drilling guides, and wedge grafts were harvested from embalmed metacarpal bones. Constructs were then tested through bending or torsion to 10 degrees rotation using a mechanical testing apparatus. Stiffness, maximum torsional force and force to 2.0 mm displacement were quantified.
Results: Double screw fixation required significantly more force to 2.0mm displacement compared to the single screw and wedge technique (mean difference: 78.3N, $p<0.05$). The double screw group had a significantly higher maximum torque in the screw tightening (clockwise) direction compared to both, the single screw and strut group (mean difference: 65.6 Nmm, $P < 0.001$), and the single screw and wedge group (mean difference: 60.6 Nmm, $P < 0.001$). It also had a significantly higher maximum stiffness in the screw tightening direction compared to the single screw and strut group (mean difference: 4.8, $P < 0.05$), and the single screw and wedge group (mean difference: 9.3, $P < 0.001$)
Conclusions: Double screw fixation of unstable waist scaphoid fractures yields greater rotational stability than single screw with a strut or wedge graft techniques. These findings suggest that use of two screws may be more effective than a single screw in preventing non-union for scaphoid waist fractures with volar bone loss.

A-0685 THE EFFECRIVENESS OF ACELLULAR DERMAL MATRIX IN CHRONIC WOUND RECONSTRUCTION

Percin Karakol, Agit Sulhan, Kadir Barış Tiryaki, Hüseyin Ulaş, Yasin Canbaz
Başakşehir Çam ve Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery, İstanbul, Turkey

Introduction: In reconstructive microsurgery, surgeons face large and difficult-to-close tissue defects. Due to immunogenic factors, closing these defects is challenging. Particularly in chronic wounds, inflammatory and proteolytic events disrupt the structural components of the extracellular matrix. Acellular dermal matrices (ADM) consist of collagen, elastin, laminin, and glycosaminoglycans. While ADM examples from human and animal sources are available, the bovine-derived product

Matriderm is frequently used. Rather than replacing the skin, ADMs support soft tissue repair and provide a favorable microenvironment for the nourishment and integration of split-thickness skin grafts (STSG).
Materials and Methods: This study retrospectively evaluated wound outcomes following ADM application in 21 patients with tissue defects secondary to diabetes and trauma, treated between February 2023 and September 2024. The cohort consisted of 5 women and 13 men. Among the cases, 9 had diabetic ulcers in the lower extremities, 6 had trauma-related defects, and 6 had tissue defects resulting from burns. All patients underwent serial debridement, negative-pressure wound therapy (NPWT), and antibiotic therapy based on culture results. ADM was applied concurrently with STSG in patients with negative culture results. Follow-ups were scheduled for postoperative day 5, and at 1 and 3 months
Results: Total graft failure was observed in one patient, and partial failure occurred in two others. In the majority of cases, wounds treated with ADM and STSG were successfully closed. However, the study's limitations include the small sample size and the lack of objective metrics to assess wound healing.
Discussion: In cases where free or pedicled flap reconstruction is not feasible for tissue defects with exposed bone due to trauma, the combination of ADM with STSG proved to be a viable alternative. This study demonstrates that ADM, used in combination with other techniques such as grafts, can play an effective role in chronic wound treatment strategies. However, larger case series are needed to achieve more robust outcomes.

A-0686 EMERGENCY OSTEOPLASTY AS A RESCUE TECHNIQUE IN FAILED THUMB REPLANTATION IN CHILD

Adam Domanasiewicz[1], Jacek Martynkiewicz[1], Jerzy Gosk[2]
[1]Provincial Specialist Hospital Dept of Orthopedics, Trauma, Hand Surgery Wrocław, Poland; [2]Faculty of Medicine, Wrocław University of Science and Technology, Poland

Introduction: Losing a thumb means a loss of hand function of 35-65%. Replantation, which is the best solution for distal one-third amputations and for crushing-avulsive amputations, is not always successful, if it is possible at all. Several "acute" rescue techniques are known, such as emergency pollicization of the 2nd finger, emergency pollicization of the damaged 2nd finger, on-top transfer of the 4th finger, and osteoplasty using a radial or inguinal flap. In the case of necrosis of the replanted finger, reamputation and possible reconstruction by toe transfer in the future are usually necessary.
Aim: The aim of the study is to present a simple and relatively technically easy and safe rescue technique that allows maintaining a functional thumb despite necrosis of the replanted part.
Material & Methods: In the years 2005-2023, the authors performed 23 different types of immediate pollicizations in a priori non-replantable thumbs, as well as approximately 20 acute osteoplastic procedures, without losing a single reconstructed neothumb. Currently, they present an osteoplasty procedure in a 12-year-old patient on the 10th day after replantation of the distal 1/3 of the thumb, which had become necrotic.
Results: A good functional result was obtained and aesthetically acceptable for the patient and the surroundings. However, an additional procedure to transfer Littler's sensory island was necessary to restore sensation.
Conclusions: The proposed method of osteoplastic reconstruction of the thumb is technically easy, safe and reliable, and not time-consuming. In adults, it can be performed under local anesthesia. The method is an alternative to other more complicated reconstructions, especially microsurgical ones, when pollicization and toe to hand transfer are not accepted by the parents.

A-0688 UTILIZATION OF A COLLAGEN-BASED DERMAL MATRIX IN HAND SURGERY: A RELIABLE TECHNIQUE FOR SOFT TISSUE COVERAGE IN COMPLEX HAND DEFECTS

Najib Kachouh, Marie Witters, Jean Baptiste De Villeneuve Bargemon, Alice Mayoly, Charlotte Jaloux
Hand and Limb Reconstructive Surgery Department, La Timone, University Hospital, Marseille, France

Introduction: Complex injuries and soft tissue defects in hand surgery present unique challenges in reconstructive approaches due to the need for durable, flexible, and aesthetic soft tissue coverage. Dermal templates (DT) have shown promise in supporting dermal regeneration, with the potential to cover noble structures, and optimize functional outcomes in hand and limb reconstruction.
Aim: This study evaluates the effectiveness of a collagen-based DT in the recovery of a variety of hand injuries -from ballistic defects with bone exposure, to necrotizing fasciitis-, focusing on its impact on wound healing and patient satisfaction with functional and aesthetic results.
Material & Methods: We conducted a retrospective analysis of 10 patients treated with Collagen-based Dermal Matrix in hand surgeries. Indications included trauma, soft tissue defects after tumor excision, and infection debridement. A collagen-based DT was applied based on defect severity and patient-specific requirements. Primary endpoints included graft take rate, time to full epithelialization, and range of motion (ROM) post-reconstruction. Secondary endpoints involved patient-reported outcome measures (PROMs) regarding aesthetic satisfaction and functional recovery.
Results: Among 10 patients, 70% demonstrated successful integration of with a mean time to epithelialization of 13 days. Functional outcomes showed a significant conservation of ROM, with no significant restriction or scar contracture reported. Patient satisfaction scores highlighted high aesthetic acceptance and comfort, with minimal reports of pain or restriction in daily activities.
Conclusions: The collagen-based DT serves as an effective dermal template in hand reconstruction, supporting both functional and aesthetic recovery in complex hand defects. Its application may enhance outcomes in hand surgery, offering a viable option for cases where traditional grafts may compromise mobility or appearance.

A-0689 POSTOPERATIVE OUTCOMES OF THERMAL SHRINKAGE FOR SCAPHOLUNATE LIGAMENT INJURY ASSOCIATED WITH DISTAL RADIUS FRACTURES

Daisuke Suzuki[1], Hiroshi Ono[1], Shohei Omokawa[2], Ryotaro Fujitani[3], Ayumu Ishizaki[4]
[1]Nishi Nara Central Hospital, Nara, Japan; [2]Nara Medical University, Nara, Japan; [3]Ishinkai Yao General Hospital, Osaka, Japan; [4]Takita Hospital, Nara, Japan

Introduction: SL ligament injuries occasionally accompany distal radius fractures and can affect postoperative outcomes. Addressing these injuries early is important, as secondary surgeries can prolong treatment duration. At our institution, we use wrist arthroscopy via the midcarpal radiovolar (MCRV) portal to evaluate the dorsal SL ligament. For cases of ligament laxity, thermal shrinkage is performed, while ruptures are managed with ligament reconstruction using DICL
Aim: This study aims to evaluate the outcomes of one-stage thermal shrinkage for SL ligament laxity associated with distal radius fractures and compare them with outcomes in patients without SL ligament injuries.
Materials and Methods: We retrospectively reviewed 254 consecutive cases of distal radius fractures treated with volar locking plate fixation. Arthroscopic evaluation of the dorsal SL ligament was performed in all cases via the MCRV portal. Ligament integrity was assessed through direct visualization and probing from the dorsal portal. Laxity was defined as looseness with preserved continuity, while rupture indicated a loss of continuity. Cases with degenerative changes,

such as CPPD, were excluded. Ten patients diagnosed with SL ligament laxity underwent thermal shrinkage, while 30 age-, sex-, and follow-up period-matched patients without SL ligament injuries served as the control group. Outcome measures included wrist and forearm range of motion (ROM), grip strength, patient-reported outcomes (qDASH, PRWE, Hand 20), and radiographic parameters (SL gap and SL angle) with a minimum follow-up of one year

Results: SL ligament injuries were identified in 56 cases (22%): 39 with laxity and 17 with rupture. Among the laxity cases, 10 underwent thermal shrinkage. After an average follow-up of 22 months, the treatment group demonstrated a mean wrist extension of 83°, flexion of 80°, pronation of 90°, and supination of 89°. Grip strength averaged 102% of the contralateral side. Patient-reported scores (qDASH: 15, PRWE: 13, Hand 20: 16) and radiographic parameters (SL gap: 1.5 mm, SL angle: 58°) showed no significant differences compared to the control group

Conclusions: One-stage thermal shrinkage for SL ligament laxity is a viable treatment option for managing this condition during surgery for distal radius fractures.

A-0690 ROUND VERSUS FLAT FIRST METACARPAL HEAD – REHABILITATION AND OUTCOME OF LIGAMENT INJURIES

Amal Sharaf[1], Yousif Yousif[2], Anna Barnard[2]

[1]Health Education England, North Eas, UK; [2]James Cook University Hospital, Middlesbrough, UK

Introduction and Aim: A flat first metacarpal head has less metacarpophalangeal joint (MCPJ) range of movement (ROM) than a rounded head. In this study, we looked into the relationship between thumb metacarpal head morphology and the rehabilitation period of post-traumatic ulnar collateral ligament (UCL) and radial collateral ligament (RCL) injuries.

Methods: A retrospective review of adult patients presented to hand trauma clinic with post-traumatic thumb MCPJ UCL and RCL injuries between May 2023 and July 2024.

X-rays were reviewed, and patients were classified into two cohorts based on the shape of the thumb metacarpal head – round and flat. Data was collected on demographics, mechanism, and pattern of injury, management plan, splinting and rehabilitation period, and outcome on discharge.

Results: Out of 29 patients presented with Thumb UCL and RCL injuries, 20 had round metacarpal. Complete or partial UCL injuries were diagnosed in 20 cases, while 9 patients were treated for RCL injuries. Seven had avulsion fracture of proximal phalanx base. Six cases required surgical repair, four of which had a round first metacarpal head.

Patients weaned off splint on hand therapists' instructions after assessing joint stability, tenderness, ROM, grip and pinch strength. The average splint time for patients with round first metacarpal head was 4.8 weeks, compared to 7.4 for patients with flat first metacarpal head.

Conclusion: Within our study, patients with flat first metacarpal head required longer splinting and rehabilitation time. We propose a wider study to assess the requirement of specific recommendations with regard to the duration of splinting and hand therapy protocol for this group.

A-0691 REDUCTIONS IN WIDESPREAD PAIN BEYOND THE FRACTURE SITE ARE ASSOCIATED WITH IMPROVED FUNCTIONAL, PSYCHOLOGICAL, AND QUALITY OF LIFE OUTCOMES IN PATIENTS WITH DISTAL RADIUS FRACTURES

LM Winiarski[1], MS Rathleff[1,3], P Larsen[1,2], TS Palsson[1]

[1]Department of Physiotherapy and Occupational Therapy, Aalborg University Hospital, Aalborg, Denmark; [2]Department of Orthopedic Surgery, Aalborg University Hospital, Aalborg, Denmark; [3]Department of Health Science and Technology, Faculty of Medicine, Aalborg University, Aalborg, Denmark

Introduction: Patients with distal radial fractures (DRF) often experience widespread pain and dysfunction, presenting as concurrent musculoskeletal complaints (MSCs) in non-injured areas of the upper limb and neck. While standard treatment focuses on the fracture site, the association between this broader pain distribution and functional, psychological, and quality of life outcomes during recovery remains understudied.

Aim: This study aimed to examine pain distribution beyond the primary fracture site during recovery and to explore associations between baseline pain extent and functional, psychological, and quality of life outcomes at the end of treatment in patients with DRF.

Material & Methods: This cohort study is based on a secondary analysis of 22 patients with DRF and concurrent MSCs (77% surgically managed, mean age 56, 77% female), who formed the largest subgroup of a previous study on an intervention targeting MSCs in the elbows, shoulders, and neck after various hand/forearm complaints. Pain sites (proximal and distal to the elbow, and total across the front and back of the body map) and total pain area (converted to Body Surface Area Percentage, BSA%) were measured at baseline and the end of treatment using digital pain mapping on a tablet (Navigate Pain, Aglance Solutions). Functional disability was assessed with the Disabilities of the Arm, Shoulder and Hand (DASH), psychological distress with the Hospital Anxiety and Depression Scale (HADS) and the Pain Catastrophizing Scale (PCS), and quality of life with the EuroQol five-dimension scale (EQ-5D and EQ-VAS).

Results: The median total number of pain sites decreased from 9 (IQR 3) at baseline to 4 (IQR 3) at the end of treatment, with a median difference of 4.5 (95% CI [2.5, 7.0]). The median pain area (BSA%) decreased from 4.5% (IQR 4.8) at baseline to 1.3% (IQR 0.9), with a median difference of 2.7% BSA (95% CI [1.8, 5.0]). Reductions in the number of pain sites were greater in areas proximal to the elbow than distal areas (rank biserial correlation rp = 0.544, 95% CI [0.041, 0.708]). The baseline number of pain sites was moderately positively associated with psychological distress at the end of treatment (HADS and PCS r = 0.5) and functional disability (DASH r = 0.3) while showing negative associations with quality of life (EQ-5D r = -0.4) and self-rated health (EQ-VAS r = -0.3). Similarly, baseline pain area was positively associated with functional disability (DASH r = 0.3) and psychological distress (HADS and PCS r = 0.3) and negatively with quality of life (EQ-5D r = -0.2) and self-rated health (EQ-VAS r = -0.3)

Conclusions: Reductions in widespread pain were associated with improved functional ability, psychological well-being, and quality of life. These results, along with observed associations between greater baseline pain extent and poorer outcomes, highlight the need for clinical awareness of widespread pain and interventions addressing it during recovery in patients with DRF. Given the small sample size and study design, these results should be interpreted cautiously. Further research is needed to confirm these associations and clarify the broader impact of widespread pain on recovery.

A-0692 EARLY COMPARATIVE RESULTS AFTER THUMB CARPOMETACARPAL JOINT REPLACEMENT

Joanna Wojna[1], Michał Kanak[2], Joanna Kot[1], Robert Rokicki[1]
[1]Hand Surgery Department, University Teaching Hospital No 2 Medical University in Łódź, Poland; [2]Medical University in Łódź, Poland

Introduction: The carpometacarpal joint of the thumb is a saddle joint with a unique anatomical architecture that allows for a wide range of motion. It is assumed that degenerative changes in the carpometacarpal joint of the thumb account for 10% of all degenerative changes affecting human joints. Osteoarthritis of the carpometacarpal joint of the thumb is the second most common location of degenerative changes in the hand. Among the methods of surgical treatment that are becoming more and more available, it is worth mentioning coincidences of carpometacarpal joint replacement of the thumb, which are modified and improved in the course of many years of experience.
Aim: Comparison of early outcomes after metacarpal thumb replacement with ARPE prosthesis - unimobile and TOUCH prosthesis - bimobile.
Material & Methods: The material consists of patients operated on at the Hand Surgery Clinic of the USK-WAM in the years 2019-2022, where 27 ARPE prostheses were originally implanted (2019-2020) and 65 TOUCH prostheses from 2021 to the present, of which 45 met the condition of one-year postoperative follow-up. The strength of the global and pincer grip of the operated hand was evaluated. Patients also completed the DASH and PRWE questionnaires.
Results: In the annual evaluation after surgery of single-mobile and two-mobile prosthetics, we did not observe significant differences in the assessment of the strength of the global and pincer grip and in the completed DASH and PRWE questionnaires.
Conclusions: In a short one-year follow-up after implantation of monocarpal and bimobile prostheses into the metacarpal joint of the thumb (CMC I), no significant differences in range of motion and strength were noted in the DASH and PRWE scales.

A-0693 THE IMPACT OF PATIENT MINDSET ON OUTCOMES OF NON-OPERATIVE TREATMENT OF CARPOMETACARPAL OSTEOARTHRITIS OF THE THUMB

G.J.G. van Gaalen[1], M.J.W. van der Oest[1], C.A. Hundepool[1,3], L. Hoogendam[1,2,3], J.S. Souer[3], H.P. Slijper[3], R.W. Selles[1,2], Hand Wrist Study Group, J.M. Zuidam[1]
[1]Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [2]Department of Rehabilitation Medicine, Erasmus MC, Rotterdam, The Netherlands; [3]Hand and Wrist Center, Xpert Clinic, the Netherlands

Background: Thumb carpometacarpal osteoarthritis (CMC-1 OA) is a prevalent condition that leads to pain and impaired hand function. Although non-operative treatments, such as orthoses, hand therapy, and corticosteroid injections, are often effective, patient outcomes can vary significantly. Recent studies have shown that a negative patient mindset can adversely affects treatment outcomes in hand and wrist conditions. However, few studies have explored its relationship with the outcomes of non-operative treatment for CMC-1 OA.
Objective: To determine whether baseline psychological factors are associated with clinical outcomes and the likelihood of conversion to surgical treatment during non-operative treatment for CMC-1 OA.
Methods: This retrospective cohort study included 1,206 adult patients treated non-operatively for CMC-1 OA. Patient mindset was assessed at baseline using the Patient Health Questionnaire (PHQ-4), Brief Illness Perceptions Questionnaire (IPQ), Credibility/Expectancy Questionnaire (CEQ), and Pain Catastrophizing Scale (PCS). Clinical outcomes were evaluated

at baseline, 3 months, and 12 months using the Michigan Hand Outcomes Questionnaire (MHQ). Linear mixed-effects models were employed to quantify the association between patient mindset and MHQ trajectories. Additionally, joint modeling was used to assess the direct and indirect effects of mindset on conversion to surgical treatment
Results: Among the 1,206 patients included, 106 (9%) underwent surgical treatment, with a median time to conversion of 180 days [IQR 110, 291]. Scores indicating a negative mindset, including PHQ depression ($p < 0.001$), IPQ Consequences ($p < 0.001$), and PCS Pain Catastrophizing ($p < 0.001$), were significantly associated with poorer MHQ scores over time. In the secondary outcome analysis, worse MHQ scores ($p < 0.001$) and higher IPQ Illness Coherence ($p = 0.02$) were associated with an increased risk of conversion to surgical treatment.
Conclusion: The baseline patient mindset significantly influenced clinical outcomes during non-operative treatment for CMC-1 OA. Additionally, mindset affected the likelihood of conversion to surgical treatment, both directly and indirectly through its impact on pain and function scores. These findings underscore the importance of mindset assessment in CMC-1 OA care. Future prospective studies are necessary to determine whether targeted mindset interventions can optimize treatment outcomes in this population.

A-0694 CLINICAL TRIAL OF WALANT VS. CONVENTIONAL ANESTHETIC TECHNIQUE IN TRAPEZIOMETACARPAL ARTHROPLASTY

Petra Llull, Carlos Diago, Tomás Aguirre, Marta Oldrati, Verónica Rico
Manacor Hospital, Mallorca, Spain

Introduction: The use of wide-awake local anesthesia no tourniquet (WALANT) in upper limb surgery has gained popularity in recent years. Initially introduced by Lalonde for flexor tendon repairs, it is now applied to more complex procedures, including trapeziometacarpal (TMC) arthroplasty. WALANT offers several advantages for patients, surgeons, and health services. For patients, benefits include the absence of motor block, adequate anesthesia, and no need for sedation, tourniquet, or pre-operative exams. Surgeons benefit from enhanced visualization due to adrenaline-induced hemostasis, and the ability to assess surgical stability via patient movement. Health services can reduce resource usage, including operating room time and personnel costs. WALANT has been successfully used for conditions such as rhizarthrosis, with Lalonde describing the technique for trapeziectomy in 2011 and Müller using it for TMC arthroplasty in 2018.
Aim: This study aims to compare the WALANT technique to the gold standard anesthetic approach (regional block with axillary plexus and tourniquet) for TMC arthroplasty. We hypothesize that WALANT will provide comparable surgical outcomes with additional benefits such as reduced perioperative anxiety, shorter surgical times, and fewer postoperative complications, establishing it as a patient-friendly and efficient alternative. The primary objective is to assess patient comfort, ensuring low or absent intraoperative anxiety, while confirming that the surgery can be performed satisfactorily with a bloodless field and adequate anesthesia. Secondary objectives include evaluating anxiety, surgical times, adverse events, postoperative pain, and patient satisfaction.
Material & Methods: Prospective, randomized, two-arm clinical trial assessing the effectiveness of WALANT in TMC arthroplasty. The experimental arm consists of patients undergoing WALANT, while the control arm receives the gold standard anesthetic approach. Patient enrollment began in December 2023, during routine consultations, where surgical intervention was offered to eligible patients. Those who consented were randomly assigned to either the WALANT or the standard anesthesia group using a computer-generated random number table.
Primary objective is to quantify anesthesia effectiveness (pain), anxiety, and hemostasis, evaluating preoperative and intraoperative times. Secondary outcomes include intraoperative opposition index, QuickDASH scores, grip strength,

need for sedation, tourniquet use, and complications. Postoperative pain will be assessed in the first week. Statistical comparisons will be made using appropriate tests, with a p-value < 0.05 considered significant.
Results: The study provides preliminary findings on the feasibility and patient satisfaction with the WALANT technique in TMC arthroplasty. While the sample size is still small, initial results suggest that WALANT is a viable and effective technique, with high patient satisfaction and adequate anesthesia and hemostasis. The technique shows potential for reducing resource use and enhancing patient comfort and surgical efficiency.
Conclusions: This study is a crucial step toward establishing a reliable protocol for ambulatory TMC surgeries using the WALANT technique. Preliminary results indicate that WALANT offers significant benefits, including reduced resource consumption, improved patient comfort, and enhanced surgical efficiency. We believe this approach could create a streamlined model for TMC surgeries, eliminating the need for general anesthesia, reducing costs, and improving the overall patient experience.

A-0695 INVESTIGATION OF FACTORS LEADING TO RECURRENT NONUNION FOLLOWING SURGERY FOR SCAPHOID NONUNION

Takuya Kameda[1], Yoko Takahashi[2], Yuki Fushimi[1], Kazuki Kobayashi[1], Chiharu Nagashima[1], Shunsuke Sato[1], Yoshihiro Matsumoto[1]
[1]Department of Orthopaedic Surgery, Fukushima Medical University, Japan; [2]Department of Orthopaedic Surgery, Hoshi General Hospital, Japan

Introduction: In cases where scaphoid nonunion fails to achieve bone union post-surgery, salvage surgery imposes a significant burden on patients, yet risk factors remain unclear.
Aim: This study investigated the characteristics of cases in which bone union was not achieved postoperatively.
Material & Methods: This descriptive study involved 36 cases (33 males, three females, ages 14–65) of scaphoid nonunion treated surgically at two affiliated hospitals from September 2010 to March 2024. Based on the final X-ray and CT assessments, cases were divided into the union group, in which bone union was confirmed, and the nonunion group, where the union was not achieved. The evaluated variables included age, BMI, duration of nonunion, smoking history, diabetes, Filan-Herbert (F-H) classification, presence of a proximal pole fragment, Moritomo classification, preoperative radio-lunate angle (RLA), postoperative RLA, MRI findings, type of internal fixation, vascularized bone grafting, bleeding from the proximal fragment, and duration of external fixation. Statistical analysis was performed using t-tests and chi-square tests, with a p-value of less than 0.05 considered statistically significant.
Results: Bone union was achieved in 30 of the 36 cases, yielding a union rate of 83.3%. The mean follow-up period was 30.6 months. Comparative analysis of the union and nonunion groups for each variable showed the following: mean age (29.8 vs. 30.7 years p=0.916), BMI (23.1 vs. 24.0 p=0.529), mean duration of nonunion (61 vs. 163 months p=0.146), smoking history (33.3% vs. 16.7% p=0.418), diabetes (3.3% vs. 0% 0.650), F-H classification (p=0.036*) - D1: 16.7% vs. 0%, D2: 30% vs. 0%, D3: 53.3% vs. 83.3%, D4: 0% vs. 16.7%, presence of proximal pole fragment (23.3% vs. 33.3% p=0.606), Moritomo classification - mobile type (66.7% vs. 50.0% p=0.438), preoperative RLA (°): -14.1 vs. -8.4 (p=0.332), postoperative RLA (°): -2.0 vs. -5.1 (p=0.506), MRI T1 low signal (36.0% vs. 60.0% p=0.317), internal fixation methods (p=0.662): fixation with K-wire (6.7% vs. 16.7%), headless screw fixation (90% vs. 83.3%), plate fixation (3.3% vs. 0%), vascularized bone grafting (20.0% vs. 16.7%), bleeding from proximal fragment (82.8% vs. 100.0% p=0.367), and duration of external fixation (5.4 vs. 4.5 months p=0.422).
Conclusion: The nonunion group had a significantly higher proportion of advanced cases according to the F-H classification.

Each recurrent nonunion cases suggested factors such as D4 fragment type, screw malposition, and prolonged duration of nonunion as contributing factors. In initial surgeries for scaphoid nonunion, appropriate treatment selection based on preoperative assessment and precise internal fixation techniques are essential for successful outcomes.

A-0696 DRUJ HEMIARTHROPLASTY AND POSSIBLE FUTURE DEVELOPMENTS

Akshay Date[1], Aalna Mittal[1], Jagmeet Bhamra[2], Jon Compson[1]
[1]Kings College Hospital, London, UK; [2]Lewisham and Greenwich NHS trust, UK

Introduction: The Distal Radio-ulnar Joint Hemiarthroplasty (DRUJ) used as part of the First Choice DRUJ System marketed by Integra has now been taken off the market due to commercial factors. However, for future developments in this field certain complications and possible improvements needed for this particular replacement may be useful when an alternative is being planned.
Aim: To assess if any lessons can be learnt from technical difficulties and/or complications of its insertion techniques in a now withdrawn prothesis which can be used for future development of DRUJ joint replacements.
Material & Methods: A retrospective review of 22 hemiarthroplasties with good sigmoid notches inserted by the same surgeon, looking particularly at any difficulties with the surgical technique, difficulties in revision and, after developing a zone classification for the wrist similar to that used for hip replacements, the bone loss associated with stress shielding.
Results: 75% of the cases showed increasing distal bone loss, in 8 over 5 zones.6 had revision surgery mainly for instability and stiffness.
Conclusions: Improvements in design and technique could include.
1. Distal only osteo integration of the stem to reduce bone loss and ease of movement.
2. Clamp system for head to control rotation as prothesis is inserted.
3. Preoperative assessment by 3D CT to assess state of sigmoid notch and bowing of distal ulna.
4. Avoiding unstable wrists or change technique to adapt.
5. Early supination to optimise rotation.

A-0697 RECONSTRUCTION OF THE TFCC USING AN ARTHROSCOPIC MODIFICATION OF THE ADAMS/BERGER TECHNIQUE

Saskia J.M. Kamphuis, Ella Taylor, Dirk J. Schaefer, Alexandre Kaempfen
University Hospital Basel, Basel, Switzerland

Introduction: Injuries of the triangular fibrocartilage complex (TFCC) are a common pathology in hand surgical practice, usually following work- or sport-related accidents. Frequently, the injury consists of an ulnar detachment in the ulnar fovea. Since the development of interventional wrist arthroscopy, it is common practice, to perform a refixation of the ligament in the fovea using an anchor or a dorsal capsulodesis in an arthroscopic fashion. However, in case of an older injury or an insufficient primary treatment, a reconstruction of the TFCC might become necessary. Adams and Berger described their technique for an open repair in 2002, which takes place through a combined palmar and dorsal approach. Despite the ligament reconstruction, the open approach regularly caused its own long-term morbidity through problems with, among others, the burr holes of the radius and ulna, and issues with the subsheath of the sixth extensor compartment. In recent years, arthroscopy has taken significant steps forward, and multiple authors have attempted arthroscopic TFCC

reconstructions in small study populations with mixed results. We will describe our experience with arthroscopic TFCC reconstruction.
Aim: We will describe our operation technique for arthroscopic reconstruction using a palmaris longus tendon strip, which was modified after the Adams and Berger technique, as well as our experience. We will also present the results of our retrospective cohort study of 18 patients with a minimal follow-up of 2 years, which is currently being conducted.
Material & Methods: We are currently in the process of performing a retrospective cohort study of patients who underwent an arthroscopic reconstruction of the TFCC using a palmaris longus strip, modified after Adams and Berger. We are evaluating Patient Reported Outcome Measures (PROMs), including the Patient Rated Wrist Evaluation (PRWE) and the visual analogue scale (VAS) for pain and satisfaction. We also include measurements of the Range of Motion, stability testing and grip strength
Conclusions: In our subjective experience, arthroscopic reconstruction of the TFCC, which was modified after the open technique of Adams and Berger, is a valid option in case of TFCC destruction and with that the failing possibility of simple refixation. We are currently conducting a study to quantify our results, using PROMs, physical examination and stability testing.

A-0698 COMPLICATIONS AND REOPERATIONS IN CORRECTIVE SURGERY OF SPASTIC DEFORMITIES IN THE UPPER LIMB

Armin Pallaver[1], Andrej Cousin[1,2], Silvia Schibli[1]
[1]Swiss Paraplegic Centre Nottwil, Switzerland; [2]Lucerne Cantonal Hospital, Switzerland

Introduction: Spasticity of the upper limb may result from traumatic brain injury, cerebral palsy, stroke or spinal cord injuries and can lead to significant functional impairment with decreased quality of life.
Surgical interventions including tendon release or lengthening, hyperselective neurectomy and arthrodesis are commonly used to correct spasticity and improve upper limb function. Although numerous reports demonstrate the substantial benefits of these corrective procedures, limited data exist on complications and reoperations.
Aim: Based on our experience in spasticity-correcting surgery of the upper limb of more than 10 years, we analyze our complications and try to identify risk factors, which should be considered in surgical treatment of these disorders.
Material & Methods: This is a single-center retrospective cohort study of all patients who have undergone spasticity-reducing surgery of the upper limb since 2012, investigating complications and reoperations. Complications are graded according to the Clavien-Dindo Classification. Reoperation is defined as repeat surgery due to recurrence of spasticity at the same level (shoulder, elbow, forearm, wrist, hand).
Results: Since 2012, we performed 159 surgeries in 115 patients with upper limb spasticity. The most common procedures were tendon procedures, followed by hyperselective neurectomy and arthrodesis. We experienced complications in 26 cases. Among these we counted 20 reoperations with recurrence of spasticity within 5 years after prior surgery. The other 6 complications included wound healing issues, hematoma, surgical site infection and pneumonia; 2 of them required revision surgery (Clavien-Dindo IIIb)
Conclusions: Surgical correction of spastic deformities of the upper limb is safe and shows satisfactory results even after repeat surgery. Balancing spastic wrist deformities by means of arthrodesis is more reliable than tendon procedures regarding recurrence of deformity, but it is associated with a higher risk of wound healing problems. When considering pronator release, careful assessment of biceps spasticity is crucial to prevent supination deformity. Hyperselective neurectomy is a promising technique in spastic thumb and intrinsic deformities.

A-0699 THE INFLUENCE OF MINDSET ON INITIAL PRESENTATION AND SURGICAL OUTCOME IN HAND AND WRIST CONDITIONS: A COHORT STUDY OF 18,729 PATIENTS

G.J.G. van Gaalen[1], N.J. Nieuwdorp[1], I.C. Jongen[1], M.J.W. van der Oest[1], R.W. Selles[1,2], C.A. Hundepool[1,3], Hand Wrist Study Group, J.M. Zuidam[1]

[1]Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [2]Department of Rehabilitation Medicine, Erasmus MC, Rotterdam, The Netherlands; [3]Hand and Wrist Center, Xpert Clinic, The Netherlands

Background: Patient mindset, including psychological factors such as pain catastrophizing, anxiety, concern, and emotional consequences, has been shown to affect both preoperative and postoperative outcomes in hand surgery. However, the magnitude and consistency of this association across a large, diverse surgically treated population remain unclear.

Objective: To evaluate the association between patient mindset and baseline pain and hand function in a large cohort of patients undergoing hand surgery, as well as to assess how mindset influences postoperative improvement in pain and function.

Methods: This cohort study included 18,729 adult patients undergoing surgical treatment for hand or wrist conditions. Baseline mindset data were collected using the Ultrashort Mental Health Screening Tool (UMHST), which assesses four domains: pain catastrophizing, anxiety, concern, and emotional consequences. Pain and hand function were measured using Visual Analogue Scales (VAS) at baseline and postoperatively. Hierarchical multivariable linear regression models were utilized to quantify the contribution of patient mindset beyond demographic factors to the explained variance (R2) in pain and function scores

Results: Patient mindset variables significantly contributed to the explained variance in baseline pain ($\Delta R^2 = 19.1\%$) and function ($\Delta R^2 = 9.8\%$) scores. Pain catastrophizing, emotional consequences, and concern were consistently associated with worse baseline pain and function ($p < 0.001$). For postoperative improvement, mindset contributed modestly to the explained variance of pain ($\Delta R^2 = 5.2\%$) and minimally to function ($\Delta R^2 = 0.3\%$). Subgroup analysis revealed that mindset scores varied significantly by diagnosis, resulting in a varying impact of mindset across these groups. Patients with nerve compression syndromes displayed the strongest associations between mindset and both baseline and postoperative outcomes.

Conclusion: In this large surgical cohort, patient mindset was a stronger predictor of baseline pain and function than demographic characteristics. Notably, preoperative mindset and its effects on pain and function differed by condition, highlighting the need for diagnosis-specific consideration of mindset in clinical decision-making. Future research using prospective designs is needed to explore the causal pathways of patient mindset and evaluate targeted mindset interventions.

A-0700 ULTRASOUND-GUIDED PERCUTANEOUS RELEASE OF THE A1 PULLEY OF THE THUMB WITH SURGICAL KNIFE ON ANTEROGRADE VERSUS RETROGRADE APPROACH: A COMPARATIVE CADAVER STUDY

Cristina Lloret Peiró[1], Miguel Nuño Pérez[1], Júlia Bargalló Granero[1], Pablo Martínez Collado[1], Fernando Dávila[2], Irene Gallardo Calero[1], Ignacio Esteban Feliu[1]

[1]Hospital Universitari Vall d'Hebron, Barcelona, Spain; [2]Hospital del Bidasoa, Spain

Introduction: There has been growing interest in use of minimally invasive techniques in hand surgery in the recent years. One of the techniques that has shown both to be safe and effective is ultrasound-guided release of A1 pulley for trigger finger.

Despite its high prevalence, fewer evidence is available for the treatment of trigger thumb with these techniques, as most of the studies have been focused on trifalangeal digits.
One of the main concerns in the treatment of trigger thumb is the proximity of the intersection of the first proper palmar digital nerve (FPDN) over flexor pollicis longus. We believe that the anatomical differences between the thumb and the rest of the digits requires specific studies.
Aim: The aim of the present study is to determine if there are any differences between an anterograde or retrograde direction for the release of the trigger thumb in terms of effectivity and safety, as well as to describe the surgical anatomy of the pulley system.
Material & Methods: We present a cadaveric study in fresh frozen specimens. The thumbs included were randomly assigned to one of the two study groups: anterograde and retrograde release
Ultrasound guided percutaneous release with Kemis K1 knife (Newclip) was performed.
After the release, dissection was carried on over the flexor pollicis longus path, from the FPDN intersection to the A2 pulley.
Descriptive data about anatomy of the thumb was recorded: pulley system of the thumb classification and FPDN distance to proximal border of A1. Release of A1 pulley was registered as complete or incomplete. Associated lesions in the neurovascular bundle, tendinous lesions and oblique pulley section were documented.
Results: 20 thumbs were included (10 retrograde and 10 anterograde).
Mean distance from proximal border of A1 pulley to the intersection of FPDN was 11mm.
Ultrasound guided A1 pulley release was complete in 90% (10) in the anterograde group and in 63% (7 cases, in the first two cases the pulley was missed) in the retrograde group, but no statistical significance was found ($p=0.1$).
Iatrogenic lesions were found more frequently in the anterograde group, although there were no statistical differences between groups. There was one complete and one partial section of FPDN in the anterograde group. Longitudinal lacerations were found in 9% in the retrograde group and in 36% of anterograde group.
No collateral artery or oblique pulley lesion were reported.
Conclusions: In terms of procedure success, anterograde release showed better results, but no statistical difference was found. The performance of these procedures in cadaveric specimens has technical particularities that can interfere with the results (normal thickness of the pulley, difference in tissue resistance).
Although the difference was not significant, a higher rate of iatrogenic lesions was found in the anterograde group, being specially concerning the complete nerve lesion due to its anatomic location.
In summary, retrograde technique appears to be safer but less successful than anterograde technique, nevertheless, more studies with a bigger sample would help us drawing conclusions.

A-0702 VARIOUS TECHNIQUES FOR PEDIATRIC OPPONENSPLASTY – A REPORT OF FOUR CASES

Gergő Józsa[1], Anna Gabriella Lamberti[1], Tamás Kassai[2], Zsombor Márton[3]
[1]Division of Pediatric Surgery, Traumatology and Otorhinolaryngology, Department of Pediatrics, Clinical Complex, University of Pécs, Pécs, Hungary; [2]Department of Pediatric Traumatology, Dr. Manninger Jenő National Traumatology Center, Budapest, Hungary; [3]Department of Anatomy, Medical School, University of Pécs, Pécs, Hungary

Introduction: Opponensplasty is a surgical procedure performed to restore thumb opposition, a critically important function for hand dexterity that allows for proper grasp. In children, congenital hand deformities, trauma, or conditions like cerebral palsy can cause thumb deficiency. The goal of opponensplasty is to reconstruct the dynamic movement of the thumb. Various techniques are used, often involving tendon transfers to recreate this vital movement.

Aim: The authors present 4 cases treated by two types of opponensplasty and their results.
Material & Methods: The authors performed opponensplasty in all four children due to congenital thumb deficiency. They examined demographic data, the type of surgery, and functional outcomes.
Results: Three girls and one boy were involved. The median age was 4.5 years (ranging from 1.5 to 10 years). In three cases, the surgery was unilateral, and in one case, bilateral surgery was performed in two stages. A total of three Huber opponensplasties and two EIP (extensor indicis proprius) opponensplasties were performed. Good functional outcomes were observed during follow-up.
Conclusions: The need for opponensplasty in the pediatric population is relatively rare but can be crucial for improving hand function in affected children, such as writing, holding objects, and self-care activities. Due to the adaptive and developing nature of the pediatric musculoskeletal system, careful surgical planning and a thorough understanding of pediatric anatomy are essential. In our experience, these surgical techniques reliably improve thumb opposition for children with thumb deficiency. Additionally, postoperative care and rehabilitation play a critical role in achieving optimal functional outcomes.

A-0704 SURGICAL TREATMENT OF INVETERATE CORONOID PROCESS FRACTURES IN CHILDHOOD - A REPORT OF TWO CASES

Anna Gabriella Lamberti[1], Tamás Kassai[2], Gergő Józsa
[1]Division of Pediatric Surgery, Traumatology and Otorhinolaryngology, Department of Pediatrics, Clinical Complex, University of Pécs, Pécs, Hungary; [2]Department of Pediatric Traumatology, Dr. Manninger Jenő National Traumatology Center, Budapest, Hungary

Introduction: Fracture of the coronoid process in childhood is a rare injury, with an incidence of 3% according to the literature, and it is usually associated with posterior elbow dislocation. Coronoid process fractures occur in 2-15% of elbow dislocations. Intra-articular fractures, which hinder elbow flexion and cause elbow joint instability, require surgical fixation.
Aim: The authors aim to present the operative treatment and follow-up outcomes of two chronic coronoid process fractures in children.
Cases: The authors examined a 14-year-old boy who presented with recurring elbow complaints. His medical history included multiple elbow injuries, with two previous supracondylar humeral fractures and one medial epicondyle fracture. At the age of 13, following a posterior elbow dislocation, reduction was performed under anesthesia. Neither the initial nor the follow-up X-ray examination showed a fracture. Due to the persistent symptoms, a three-month follow-up X-ray was performed, which revealed a 5 mm, rounded bone fragment ventral to the coronoid process. An MRI and CT scan showed posterior subluxation of the elbow with the chronic fragment of the coronoid process. Due to elbow joint instability, reconstruction surgery was performed through an anterior approach. The fragment was removed and the defect was reconstructed using a cortical bone autograft taken from the iliac crest, which was stabilized with two Herbert screws. Postoperative X-ray showed the graft in a good position with full joint congruence. Three weeks later, after removing the cast, physiotherapy was started to mobilize the limb. At the three-month follow-up, elbow function was complete, and no joint instability was observed. At the eight-month follow-up, the child was asymptomatic, and an X-ray confirmed graft incorporation.
An 11-year-old girl was examined for left elbow complaints. Her medical history included several elbow injuries, including four previous posterior elbow dislocations. For the fourth time, her elbow dislocated spontaneously. Each time, closed reduction and casting were performed. Based on the provided X-rays and CT scans, the cause of the dislocation was not

identifiable. A detailed investigation, stability testing under anesthesia, and a CT scan confirmed an inveterate fracture of the coronoid process and posterior elbow instability. Through a ventral approach, the pseudoarthrosis of the coronoid process was located, the fragment was removed, and a cortical bone autograft taken from the iliac crest was fixed in place with two Aspire screws. The postoperative X-ray revealed that the graft was in the correct position. Three weeks later, after the cast was removed, physiotherapy began to restore limb mobility. During follow-up, no signs of joint instability were noted. The elbow function was fully restored, and the X-ray confirmed the successful integration of the graft.
Conclusions: Recognition of coronoid process fractures in children is crucial, as untreated cases can lead to elbow instability and loss of function. Coronoid process fractures are rare injuries, occurring in 2-15% of posterior elbow dislocations. Since they are most commonly associated with posterior elbow dislocations, it is essential to consider this fracture type in similar cases to prevent long-term complications and functional impairment.

A-0705 NERVE TRANSFER RESTORATION OF FUNCTION IN CERVICAL MOTOR RADICULOPATHY

Natalie Hope[1] , Hui Tian Tai[2] , Yoong Miin Choy[2] , Christopher McGhee[1,3], Dominic Power[1,3]
[1]Peripheral Nerve Injury Unit, Queen Elizabeth Hospital, Birmingham, UK; [2]Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia; [3]HaPPeN Research Group, Institute of Translational Medicine, University Hospitals, Birmingham, UK

Introduction: Degenerative cervical spine disease may result in a motor radiculopathy causing weakness in the distribution of the exiting nerve root at that level. Nerve root palsy is a recognised complication of cervical spine decompression surgery. C5 is the most commonly injured nerve root with a reported mean incidence of 4 to 6%.
Nerve transfer surgery is a commonly used technique to reconstruct a non-functional nerve, especially in the case of nerve root avulsion. The aim is to reinnervate the distal musculature supplied by the injured nerve. Nerve transfer is a potential option for treatment of nerve root palsy in patients with degenerative cervical spine disease.
Aim: This study aims to evaluate the efficacy of patients undergoing nerve transfer surgery for C5 and/or C6 palsy in the setting of concurrent degenerative cervical spine disease, which has been managed either operatively or non-operatively.
Material & Methods: This is a retrospective review of patients undergoing nerve transfer surgery for C5/C6 palsy in the setting of underlying degenerative cervical spine disease at our Peripheral Nerve Injury Unit. Patient demographic data and co-morbidity data were reviewed. Pre-operative neurophysiological data and relevant shoulder imaging was reviewed if available. Post-operative MRC grade at final follow-up was used to classify the outcome of nerve transfer operation. Outcomes were graded as follows:-
(1) "Success": MRC grade <= 4 (2) "Partial Success": 3 <=MRC<4 (3)"Failure": MRC <=2.
Results: 19 patients from April 2012 to March 2023 underwent a total of 46 nerve transfer procedures for C5 and/or C6 palsy and all patients had concomitant degenerative cervical spine disease. 13/19 (68%) patients underwent cervical spine surgery and 4/13 (31%) had intra-operative dural tears. 2 patients undergoing 3 nerve transfers were lost to follow-up, both of which had undergone cervical spine surgery.
29/43 (67%) nerve transfers had a successful outcome (MRC>=4), 9/43 (21%) had partial success
and there were 5/43 (12%) failures. Patients with confirmed rotator cuff tears did not undergo transfer to the suprascapular nerve.
Discussion: This is the largest single centre study of patients undergoing nerve transfer for C5 and C6 palsy with underlying degenerative cervical spine disease. This study includes patients that underwent cervical spine surgery and those that were ineligible for surgery. Nerve transfer is typically performed in younger patients with obstetric or traumatic brachial plexus injuries. With multi-level degenerative spine disease, the quality of the donor nerve may be compromised. The true period

of denervation is difficult to determine. In addition, the presence of age-related shoulder pathology may compromise outcomes. Despite these additional factors, the overall success rate for achieving MRC grade <=4 was 67% for nerve transfer. The mean time to nerve transfer following spine surgery was 13 months (median 8 months, range 3-48 months). Conclusion: Nerve transfer is a potential surgical option for patients with motor radiculopathy affecting C5 and C6. It may help improve function for patients who are not candidates for cervical spine surgery or those who have deteriorated post-operatively and failed to recover.

A-0706 BEYOND THE FIRST CUT: HYPOTHENAR FAT PAD FLAP FOR RELIABLE RELIEF IN RECURRENT CARPAL TUNNEL SYNDROME

Lucian Stratan[1], Stefana Avadanei-Luca[2], Carmen Ion[3], Mihaela Mastacaneanu[1]
[1]University Hospital of Martinique, Fort-de-France, Martinique; [2]Saint Spiridon Emergency Hospital, Iasi, Romania; [3]Clinique Médipôle Savoie, Challes-les-eaux, France

Introduction: Carpal tunnel syndrome (CTS) is one of the most common nerve entrapment syndromes, and recurrence after primary surgery can occur due to various factors, such as perineural fibrosis, inadequate release of the transverse carpal ligament, or additional compression from surrounding structures. Treatment for recurrent CTS remains a challenge, as it often requires not only re-decompression but also protection of the median nerve from further fibrosis. Current surgical solutions for recurrence include artificial nerve conduits, local flaps like the hypothenar and thenar flaps, muscle flaps, and fat pads. Among these, the hypothenar fat pad flap has gained recognition due to its anatomical proximity to the carpal tunnel, ease of harvest, and cushioning effect that provides protection without extensive dissection or specialized materials.
Aim: This study evaluates the use of the hypothenar fat pad technique for treating recurrent CTS, emphasizing its benefits such as shorter operating time, procedural simplicity, and reduced complication rates.
Material & Methods: We conducted a retrospective analysis of 30 patients treated for recurrent CTS over three years using the hypothenar fat pad flap. The cohort, comprising 70% women with a mean age of 51 years, was assessed for preoperative symptoms, surgical outcomes, complications, and postoperative satisfaction. Preoperative evaluations included the presence of pain, Tinel's sign, and scratch test positivity. Postoperative assessments focused on the resolution of symptoms, complication rates, time to functional recovery, and patient-reported satisfaction.
Results: The results demonstrated that 90% of patients experienced significant relief from pain and paresthesia, with Tinel's sign resolving in 85% of cases postoperatively. The average time to resume daily activities was three weeks, ranging from two weeks to one month. Minor complications, such as transient sensory deficits, were observed in 10% of patients, while no major motor deficits, infections, or flap failures were reported. Patient satisfaction was high, with 93% rating their experience as good to excellent, reflected in a mean satisfaction score of 2.9 out of 3
Conclusions: In conclusion, the hypothenar fat pad technique is an effective and efficient option for managing recurrent CTS. It combines procedural simplicity with excellent clinical outcomes, including significant symptom relief, minimal complications, and high patient satisfaction. These findings highlight the hypothenar fat pad flap as a preferred technique in appropriately selected cases of recurrent CTS. Further research involving larger patient cohorts and long-term follow-up is recommended to confirm these results and explore broader applications of this approach.

A-0707 DO THE CLINICAL AND RADIOGRAPHIC RESULTS OF TRAPEZIOMETACARPAL PROSTHESIS HOLD UP IN THE LONG TERM? ANALYSIS OF A COHORT OF PATIENTS AT 6 AND 13 YEARS FOLLOW-UP

Adriano Toffoli, Benjamin Degeorge, Jacques Teissier
Division of Hand, Shoulder, and Upper Extremity Surgery, Clinique Saint Jean Sud de France, Montpellier Métropole, Saint Jean de Védas, France

Introduction: Trapeziometacarpal (TMC) arthroplasty has become one of the leading treatment options for TMC joint osteoarthritis.
Aim: The aim of this study was to compare the clinical and radiographic results of a cohort of patients operated on with the Maia® prosthesis at a minimum of 5 and 10 years' follow-up.
Material & Methods: A retrospective study was carried out on a single-center cohort of 76 patients (92 Maia® arthroplasties). We compared the results of the cohort at 6 and 13 years' follow-up. Clinical assessment included pain, mobility, Kapandji opposition score, strength (grip and pinch) and QuickDASH functional score. Radiographic analysis using Kapandji incidences looked for signs of sinking or loosening of trapezial and metacarpal implants, and polyethylene wear.
Results: The average age of patients at the time of surgery was 67 (min = 53, max = 84). VAS was comparable in the medium and long term: 1.2 (1.8) at 6 years vs. 1.3 (1.6) at 13 years. The QuickDash score was also comparable: 17.5 (16.3) at 6 years vs. 19.6 (16) at 13 years. Postoperative mobility at 6 and 10 years was comparable to preoperative mobility. We observed a non-significant decrease in palmo-digital strength, with 23.4 kg (7) at 6 years vs. 21.5 kg (7.3) at 13 years. Similarly, we observed a non-significant decrease in digital pollici strength with 5.8 kg (2.6) at 6 years vs. 5.5 kg (2.4) at 13 years. Radiographically, we identified 3 cases of polyethylene wear in asymptomatic patients at 13 years. There were no cases at 5 years. The 7 cases of partial peri-trapezial osteolysis observed at 5 years remained stable. However, 4 new cases of trapezial cup subsidence were reported, bringing the total to 8 at 13 years. At 6 years, 4 implants had been revised for loosening of the trapezial cup. At 13 years, 4 additional implants were revised, 2 for trapezial loosening and 2 for instability due to polyethylene wear. Survival at 6 years was 88% (95% CI: 84-93) vs. 93% at 10 years (95% CI: 87-98).
Conclusions: Evaluation of the Maia® prosthesis at more than 10 years confirms the implant's stability over time, compared with results at more than 5 years.

A-0708 COMPARISON OF MANUAL AND MOTOR-POWERED REAMING TECHNIQUE FOR TRAPEZIUM PREPARATION IN THUMB CMC1 JOINT REPLACEMENT

Bram Van Hove[1], Sebastian Peters[1], Laurens Van Melkebeke[2], Joris Duerinckx[2]
[1]Regionaal Ziekenhuis Heilig Hart Leuven, Belgium; [2]Ziekenhuis Oost-Limburg, Genk, Belgium

Introduction: The optimal technique for preparing the trapezium during thumb carpometacarpal (CMC1) joint replacement remains uncertain. Manual and motor-powered reaming are both used, each offering theoretical benefits and drawbacks. Manual reaming may provide tactile feedback and control, while motor-powered reaming is hypothesized to deliver greater precision and consistency. This study aimed to evaluate the differences between these two techniques in terms of accuracy, shape uniformity, and clinician variability, using simulated bone models.
Methods: To simulate different bone qualities, we utilized rigid polyurethane foam blocks of densities 15 PCF (osteoporotic bone) and 25 PCF (standard bone). These blocks provide consistent properties in the range of human cancellous bone, despite not replicating its microstructure. A total of 432 trapezium models (216 per density) were reamed using standard Kerimedical® Touch prosthesis instrument sets, with manual and motor-powered techniques performed by both novice

and expert clinicians. The reamed cavities were evaluated for dimensional accuracy and uniformity using micro-CT scans. Parameters assessed included volume consistency, shape deviation. We also took note of toggling of the reamer during the reaming process.
Results: Motor-powered reaming demonstrated significantly reduced toggling compared to manual reaming. Cavities prepared with motor-powered reaming were more consistent in both shape and volume, providing a uniform geometry better suited for cup insertion. Manual reaming, in contrast, showed greater variability in outcomes, particularly among novice clinicians
Conclusions: Motor-powered reaming is superior to manual reaming in achieving consistent, uniform trapezium cavities with minimal toggling, making it the preferred technique for trapezium preparation in thumb CMC1 joint replacement. However, slower reaming speeds are advised to mitigate the risk of thermal necrosis. further research is necessary to evaluate in-vivo outcomes, especially comparing secondary loosening and heterotopic ossification.

A-0709 DISTAL RADIAL OSTEOTOMY. A SIMPLE , CHEAP, RELIABLE, 2 PLATE TECHNIQUE AND THE RESULTS OF CORRECTION OF MALUNION IN 50. CASES 25 25 DORSAL.VOLAR AND

S Ahmed, R Rees-Goddard, A Akilapa, K Karthik, J Compson
Kings College Hospital. London, UK

Introduction: With the rise in use of expensive CT based osteotomy jigs, we present a cheap, simple reliable 2 plate system for distal radial non-unions.
Aim: To highlight and illustrate an alternative (2 plate technique) technique for distal radial fracture Mal-unions and to assess reduction as well as complications
Material & Methods: A retrospective view of notes and x-rays of 50 cases of distal radial malunions, assessing reduction of DRUJ and carpal alignment as well as standard distal radial parameters and complications
Results: Good reduction for length and alignment of carpus and radius in majority of cases, though reduction of carpus itself not so good despite correction of tilt. Reduction of DRUJ worse in Tolat 2 DRUJs and correcting radial length though most satisfactory. Complications included Single non-union, and 1 in 4 dorsal plates needed removing.
Conclusions: Good reliable method of correcting distal radial Mal-unions though could have done better in lengthening and reducing DRUJ. Carpal Mal-alignment remained in poor alignment despite good correction of joint tilt in most patients.

A-0710 FROZEN FINGER REPLANTATION: RESULTS OVER 17 YEARS

Jan Menoušek[1,2], Zdeněk Dvořák[1,2], Ivan Nikolić[1], Dominik Bóka[1], Andrej Berkeš[1,2]
[1]Department of Plastic and Aesthetic Surgery, University Hospital at St. Anne in Brno and Faculty of Medicine of the Masaryk University, Brno, Czech Republic; [2]Faculty of Medicine, Masaryk University, Brno, Czech Republic

Introduction: Presentation of the results of treatment of patients with amputation injuries of the upper extremity whose amputated fingers were inadequately treated and sustained cold injury during transport to a replantation center.
Aim: evaluation of the success rate of replantation of inadequately treated finger amputations.
Material & Methods: a retrospective study comprising a cohort of 30 patients (23 men, 7 women) operated on at the Department of Plastic and Aesthetic Surgery, St. Anne's University Hospital, Brno, between January 1, 2007 and October 31, 2024. 42 amputated fingers of the upper limb (finger I 6x, finger II 12x, finger III 8x, finger IV 10x and finger V 6x) were treated during this period. In 16 cases it was the right hand and in 14 cases the left hand. The median length of

hospitalization was 10 days. The median age at the time of injury was 41 years. In 16 cases, the amputations were encased in ice cubes, twice in ice chips, 4 times in frozen food (vegetables), once in ice cream, once in snow, and 6 times "frozen" (no description of the cooling medium).
Results: Primary amputation was performed in 13 patients (18 fingers) of which in 11 cases due to mechanical destruction of the amputate, 1x at the patient's request and 1x due to comorbidities. Three patients were treated with the composite graft method, all grafts healed successfully. Replantation was indicated in 18 patients (22 fingers) out of 30 patients. Perioperative complications were frequent in replanted fingers, specifically in 10 patients (arterial thrombosis 4 times, need to use a vein graft on an artery 3 times, vein anastomosis crossing 2 times, need to use a vein graft 1 time, and rapid development of burn changes 2 times). Revision surgeries were performed in 7 patients, the reason for which was arterial thrombosis 3 times, venous thrombosis 3 times, bleeding 1 time, and two surgeries resulted in egalization. Failure of replantation occurred in 7 fingers in 7 patients. The overall success rate of frozen finger replantation was 68%.
Conclusions: even inadequately treated and frost-damaged amputates can be replanted with a relatively high success rate, but more frequent perioperative and postoperative complications should be considered.

A-0711 DOUBLE TRAPEZIOMETACARPAL AND SCAPHO TRAPEZIO TRAPEZOID ARTHROPLASTY IN PERI-TRAPEZIAL OSTEOARTHRITIS. CLINICAL AND RADIOGRAPHIC RESULTS

Adriano Toffoli, Benjamin Degeorge, Jacques Teissier
Division of Hand, Shoulder, and Upper Extremity Surgery, Clinique Saint Jean Sud de France, Montpellier Métropole, Saint Jean de Védas, France

Introduction: The gold standard for surgical treatment of symptomatic and painful peri-trapezial osteoarthritis after failure of medical treatment remains trapezectomy +/- suspension ligamentoplasty and/or interposition. Other treatment options include isolated trapeziometacarpal (TMC) prosthesis, which some authors believe reduces pressure on the scapho trapezio trapezoid (STT) joint, resection of the distal pole of the scaphoid with arthroscopic partial trapezectomy, or double pyrocarbon interposition arthroplasty of the TMC and STT. The double arthroplasty combining TMC MAIA prosthesis + STT INCA implant was designed to stabilize the STT joint, thus preventing the risk of carpal instability secondary to resection of the distal pole of the scaphoid.
Aim: To assess the mid term clinical and radiographic results
Material & Methods: 9 patients with a mean age of 69 years were evaluated. Clinical assessement included pain (VAS scale), mobility, Kapandji opposition score, strength (grip and pinch) and QuickDASH functional score. Radiographic analysis using Kapandji incidences looked for signs of implant sinking or loosening, polyethylene wear, ectopic ossifications and carpal instability.
Results: Mean follow-up was 42 months postoperatively (min=26, max= 73). Postoperative VAS was 1.7/10. The mean opposition score was 9/10. The mean QuickDash score was 29.2/100. Pinch strength was measured at 4.85 kg and grip strength at 16.3 kg, representing a 74% improvement. Mean antepulsion and abduction were 35° and 30° respectively. No revision surgery was performed. Radiographically, there were 2 cases of radiolucency around the INCA implant, 1 trapezial implant subsidence and 1 stable raliolucency aroud the trapezium. There was no polyethylene wear. No cases of ectopic ossification were reported. There were no changes in the metacarpal stems. No carpal instability was observed
Conclusions: The good clinical results and medium-term survival of MAIA + INCA double arthroplasty must be weighed against radiological complications and the small size of the population. This is an additional option in the therapeutic arsenal for peri-trapezial osteoarthritis, whose treatment represents a real surgical challenge.

A-0712 DIRECT INTRAOPERATIVE RADIATION EXPOSURE AMONG PLASTIC HAND SURGEONS

Iulia Marinescu[1], Sean Curran[1,2], Khairun Izlinda Abdul Jalil[1], Paul Sullivan[1,2], Roisin Dolan[1,3]
[1]Royal College of Surgeons in Ireland, Dublin, Ireland; [2]Connolly Hospital Blanchardstown, Dublin, Ireland; [3]St Vincent's University Hospital

Introduction: Intraoperative imaging is crucial in the management of hand fractures, to maximize preservation of function and range of motion. However, radiographs carry a risk for both direct and indirect radiation exposure to the operating staff, especially if appropriate preventative measures are not followed. In the long term, cumulative exposure can lead to eye and skin conditions and various malignancies. Exposure of surgeons' hands to intraoperative radiographs often occurs due to a need for close manual manipulation of the patient's digits, the necessity to maintain stability and time pressure.
Aim: This study aims to assess the prevalence of non-patient digits appearing in saved intraoperative radiographs and elucidate prevention strategies. By quantifying potential radiation risk and assessing compliance with radiation safety standards we seek to identify areas for targeted improvement in protocols and training.
Material & Methods: A multicenter retrospective analysis of hand surgery cases during which intraoperative fluoroscopy was used was performed. Data was extracted from intraoperative imaging records stored in the Picture Archiving and Communication System (PACS). An extensive review of the literature was performed to identify techniques that can be used to reduce surgeon exposure to direct radiation.
Results: A total of 185 procedures performed between 2022-2024 were included. Non-patient digits were present in intraoperative radiographs in 24% of cases. A logistic regression analysis was performed to determine whether factors such as lead surgeon grade or timing of operation had an effect on non-patient digits presence in intraoperative imaging. Most cases were performed by consultants (61.36%) and during normal working hours (75%). These factors were not significant predictors ($p > 0.05$) of the results. Risks can be minimized while maintaining surgical and imaging accuracy by the use of various instruments to aid with patient digit positioning and using personal protective equipment such as lead gloves.
Conclusions: The study highlights a need for specific recommendations related to training, use of protective equipment, and positioning protocols in order to reduce the risk of surgeons' exposure to radiation.

A-0713 CLUSTER OF AGGRESSIVE STREPTOCOCCUS PYOGENES INFECTIONS

Adrienn Lakatos, Balazs Lenkei
B.-A.-Z. County Teaching Hospital Traumatology Department

Between March and June 2024 we experienced a surge of aggressive Streptococcus pyogenes infection. In our hospital, that is responsible for approximately 1 million inhabitants, 30 patients were treated with symptoms of necrotising fasciitis. 15 of them needed treatment in intensive care unit and 10 cases were fatal. 7 of them presented with inflammation of the upper extremity. Since the initial cluster, every month we meet one or two patients with similar symptoms.
Most of these patients had some kind of upper respiratory tract infection prior the inflammation of the extremities. At presentation in lab parameters we found extremely high WBC count and CRP, and kidney function was very poor. At urgent surgery, aggressive debridement was performed, we found typical dishwasher-like fluid in the subcutaneous space. The fascia was discolored, the veins thrombotised, in some cases the muscles were affected as well.
After vigorous consultations we found the optimal treatment in extreme high dose of penicillin G (6x 4 million IU) and additional Clindamycin or Linezolid.
This obvious rise in necrotising fasciitis cases makes one think about the causes and advanced approach of these infections.

There are publications that mention the effect of COVID-19 pandemic, either the altered immune system or the change in habit of hand disinfection. We have to be open and prepared for these cases and treat them as efficiently and even aggressively as possible to avoid the fatal outcome.

A-0714 THE ROLE OF OPERATIVE TECHNIQUE IN PEDIATRIC HAND SYNDACTYLY TREATMENT - TERTIARY CENTRE EXPERIANCE

Djordje Kravljanac[1,2]
[1]Institute for Mother and Child Healthcare of Serbia, Belgrade, Serbia; [2]Medical Faculty University of Belgrade, Serbia

Introduction: Operative separation of congenitally fused fingers is one of the most demanding procedures in pediatric hand surgery.
Aim: Assessment of the outcome after surgical correction of the hand-webbed fingers in children.
Material & Methods: The retrospective study included children with congenital hand syndactyly divided into two groups and operatively treated under general anesthesia. The classical technique using skin grafts was applied in the first group of patients. The other group of patients was treated with intraoperative skin expansion of the dorsal hand and local flaps, without skin grafting. Children were reviewed for age, sex, type of syndactyly, affected hand, type of conjunction, webbed fingers localization, type of surgical procedure, and outcome of surgery. The treatment outcome was assessed according to Weber's descriptive method.
Results: The study included 61 children (42 boys, 19 girls), treated in the tertiary pediatric centre between 2015 - 2023. The mean age was 17 months (range 6 months -6 years). The left hand was affected in 30 patients, the right one in 13 cases, and 18 children had syndactyly of both hands. The predominant type was complete syndactyly (63,93%). Soft tissue syndactyly was present in 53 cases and bone fusion in eight patients. The most common localization was the third web (54,1% of cases) followed by the second web in 19,1% of the patients. According to Weber's descriptive method, in the first group, which included 31 children, 48% had good results, 37% were satisfactory, and five patients had bad results. In the second group, which included 30 patients, the results were good in 80% of cases, satisfactory in 16.7%, and bad results existed only in one child.
Conclusions: Hand syndactyly correction in children is still a big challenge. Intraoperative tissue expansion without skin grafts is an alternative approach for the webbed fingers. Better functional and aesthetic results can be expected after no graft procedure than the classical operative method.

A-0715 MINIMAL SMALL PLATE OSTESYNHESIS IN FREE VASCULARIZED TOE JOINT TRANSFER

University Hospital Olomouc

Introduction: free vascularise joint transfer is a challenging procedure due to the small size of the flap
Aim: present author's experience with minimal - two screw plate fixation to minimize damage of tiny flap vessels and early rehabilitation
Material & Methods: case series
Results: A reasonable range of motion was achieved in all patients
Conclusions: only two screw plate fixation is sufficient to achieve reasonable stability for early postop movement of the transferred joint

A-0716 MID-TERM CLINICAL RESULTS OF REVISION STRATEGIES FOR COMPLICATIONS AND FAILURE OF TRAPEZIOMETACARPAL JOINT ARTHROPLASTY BASED ON RESIDUAL TRAPEZIAL BONE STOCK: AN ANALYSIS OF 52 CASES

Adriano Toffoli, Benjamin Degeorge, Jacques Teissier
Division of Hand, Shoulder, and Upper Extremity Surgery, Clinique Saint Jean Sud de France, Montpellier Métropole, Saint Jean de Védas, France

Introduction: Trapezial implant failure is the main cause of revision trapeziometacarpal arthroplasty. Early failures are most often due to osseointegration defects. Late failures are the result of polyethylene wear leading to instability or granulomatous reaction to wear debris, causing peri-trapezial osteolysis and loosening. Trapezectomy is the gold standard for revision surgery.

Our aim was to evaluate the results of the main alternatives to trapezectomy in the revision strategy.

Material and methods: The mean age of patients at the time of revision was 65 years.

Surgical revision strategies depended on trapezial bone stock:

- Trapezial cup replacement (impacted or cemented) without bone grafting: 11 cases.
- Trapezial cup replacement with bone grafting (cancellous or corticospongious): 22 cases.
- Trapezial cup replacement with dedicated revision implant: 3 cases.
- Trapezectomy with scapho-metacarpal prostheses: 7 cases.
- Pyrocarbon interposition implant: 3 cases.

Results: Mean follow-up was 9.6 years post-op.

The VAS was evaluated at 1.7/10. The mean opposition score was 8.6. The mean Quick Dash score was 23.7/100. Pinch strength was measured at 57% on the contralateral side when healthy. 5 cases of secondary revision surgery were observed, 4 for trapezial loosening, 1 for instability. Survival of these revision implants was 91% at 9 years. Radiographically, 37% of revision implants had stable radiolucencies.

Discussion: Trapezectomy is the gold standard for surgical revision of failed trapeziometacarpal arthroplasties. The literature reports results equivalent to those of primary intention trapezectomy. This series demonstrates that a prosthesis can nevertheless be retained in certain specific cases, thereby preserving the benefits of a prosthetic arthroplasty: preservation of thumb length with correction of the Z deformity, better preservation of thumb-index strength and improved aesthetic appearance.

Conclusion: Trapezectomy is not the only surgical option after failed trapeziometacarpal arthroplasty. The surgical revision strategy is guided by the residual trapezium bone stock.

A-0717 RESORBABLE MAGNESIUM HEADLESS COMPRESSION SCREWS: SHORT TERM EXPERIENCE OF A NOVEL IMPLANT

Soha Sajid[1], Simon Pickard[2]
[1]Dudley Group of Hospitals, Dudley, UK; [2]Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, UK

Introduction: Magnesium alloys were first introduced as biodegradable screws in clinical practice around 2013. Their primary advantage is resorption of the implant, eliminating the need for removal. Additional benefits include osteoconductivity, reduced infection rates, and minimised artifact on magnetic resonance imaging (MRI). However, a key issue has been hydrogen gas production during degradation of the magnesium alloy, leading to lucency and potential cavity formation around the screw.

KLS Martin has developed a novel coating for magnesium implants that slows degradation, reducing gas formation. This cohort study evaluates the short-term clinical and radiological outcomes of KLS Martin HBS 2 Resorb Mg headless compression screws at a regional tertiary center.

Aim: This study reviews any short-term clinical or radiological complications of this device.

Material & Methods: Eight patients were included in this study with follow-up durations ranging from 1 to 5 months. The cohort consisted of:

*Scaphoid fractures: 2 acute fractures (both male) fixed with screw alone, 1 fracture non-union (male) which was fixed with iliac crest bone graft and screw.

*Arthrodesis: 2 metacarpophalangeal (MCP) joints (1 male with spasticity, 1 female with osteoarthritis); 1 proximal interphalangeal (PIP) joint (female with osteoarthritis), 1 distal interphalangeal (DIP) joint (female with osteoarthritis), and 1 thumb interphalangeal (IP) joint (male with neurodegenerative disorder).

Clinical and radiological complications were assessed.

Results: Of the eight patients, six experienced no complications within the short-term follow-up period. There were two problems encountered.

*Case 1 (failure): A male patient with a scaphoid non-union experienced screw failure at 6 weeks, likely due to steep resection angles at the osteotomy site.

*Case 2 (complication): A female patient with DIP joint arthrodesis developed swelling and inflammation at 9 weeks, with dorsal cortical defect within the distal phalanx. Screw removal resolved symptoms by 12 weeks.

Radiological fusion was observed in all cases within 4–6 weeks except for the patient with the scaphoid non-union who had screw failure.

Conclusions: Short-term outcomes with HBS 2 Resorb Mg screws have been favorable, with most patients achieving radiological fusion and no significant complications. Failure occurred in high biomechanical stress conditions and there was one case of infection, which resolved post-removal.

Further studies are needed to assess long-term outcomes, including the resorption timeline and larger patient cohorts to validate these findings.

A-0718 PREDICTING OF THE INCIDENCE OF SURGICAL TREATMENT FOR DISTAL RADIUS FRACTURES IN THE ELDERLY

Søren Perregaard[1], Rasmus Wejnold Jørgensen[1,2], Marcus Landgren[1,3]

[1]Department of Orthopedic Surgery, Hand Surgery Unit, Copenhagen University Hospital, Herlev and Gentofte, Gentofte, Denmark; [2]Department of Orthopedic Surgery, Trauma Unit, Copenhagen University Hospital, Herlev and Gentofte, Herlev, Denmark; [3]University of Copenhagen, Faculty of Health and Medical Sciences, Institute of Clinical Medicine, Copenhagen, Denmark

Introduction: Increasing diversity amongst orthopedic and hand surgeons has occurred in the interpretation of the existing evidence on treatment of elderly with Distal Radius Fractures (DRFs). Most randomized studies on non-surgical vs. surgical treatment conclude equivalent clinical outcomes in patients 65 years and older with minimal radiographic displacement. This is true for patients with low functional demand, but uncertain in patients with moderate or high functional demand. Non-surgical treatment may provide valid and a cost-saving alternative to surgical treatment. On the other hand, using age as a proxy for function and recommending non-surgical treatment could be a potential risk of undertreatment and increased costs if the domestic care is needed. The level of function should be addressed in the development of new treatment guidelines for DRF especially relevant for the elderly patients, hence an assessment instrument is warranted for this group of patients.

Aim: Does the use of an assessment tool for evaluating function change the incidence of surgical treatment in the elderly with DRFs?
Material & Methods: This retrospective cohort study consisted of a review of medical records of all patients that earlier had been surgically treated for a DRF between January 1 and December 31, 2018, at the Orthopedic Department, Herlev and Gentofte Hospital, Copenhagen, Denmark. Of the 295 surgically treated fractures, 157 patients were between 18 and 64 younger and excluded, leaving 131 patients 65 years and older. All patients had been treated with volar locking plates due to a primarily non-reducible or a secondary re-displaced DRFs according to the Danish National Clinical Guidelines (DNCG) from 2014. In January 2024, during the developing of a new treatment guideline in the Capital Region of Denmark this cohort was re-evaluated to determine if they would have been surgically treated according to the new suggested guideline. The radiological criteria indicating for surgical treatment, like the Swedish National Guideline from 2021, with treatment according to a patient's level of function; high, moderate, and low functional demand. The Clinical Frailty Scale (CFS) used to determine the functional demand at the time of surgery. Patients having a CFS 1 to 3 were considered as high, 4 to 5 moderate, and 6 to 9 low level of functional demand. A review of radiographs on all patients was performed to determine if a patient would have been surgically treated according to the new treatment guideline.
Results: Mean age of the study population was 75 years (65 to 94) and 88% were female. 8% were Barton's, 12% Smith's, 29% intraarticular, and 51% extraarticular fractures. The patients were scored as 73% (n=95) high CFS 1-3, 23% (n=31) moderate CFS 4-5, and 4% (n=5) low functional demand CFS 6-9. Of the 131 patients, 117 (89%) would have been surgically treated according to the new treatment guideline in the Capital Region of Denmark
Conclusions: 11% lower incidence of surgical treatment could be expected using Clinical Frailty Scale as decision aid with the new treatment algorithm.

A-0719 QUANTITATIVE MUSCLE ULTRASOUND BY ELASTOGRAPHY AND GRAYSCALE ANALYSIS IN INNERVATED AND DENERVATED INTRINSIC HAND MUSCULATURE

Georg Erbach, Nadja Grob, Rémy Liechti, Esther Vögelin
Insel Hospital University Hospital of Bern, Bern, Switzerland

Introduction: Quantifying muscle recovery during reinnervation is challenging, clinically EMG analysis and power surrogate parameters are often used. Sonography offers point-of-care evaluation for additional information. Here, grayscale analysis has been used to assess reinnervation by echogenicity. provides structural information, such as echogenicity, but depends on device settings and requires off-device processing. Elastography is widely used in other fields to quantify tissue stiffness, and has been investigated for use in denervated musculature. Our study aimed to compare the feasability of these in healthy subjects and explore its application in pathological subjects.
Materials and Methods: Ten participants, including seven healthy and three with intrinsic muscle atrophy after ulnar nerve injury (median 2 years postoperatively), underwent sonographic evaluation. For the healthy subjects, first dorsal interosseous, deltoid lateral head and tibialis anterior muscle was evaluated longitudinally and in its cross-section. Healthy subjects were examined using a Philips EPIQ 5 with an 18–4 MHz transducer, and pathological subjects were imaged using a Siemens ACUSON Sequoia with an 18–6 MHz transducer. Grayscale analysis was conducted using ImageJ 1.54g, and elastography was computed via integrated modules. Muscles were compared to the contralateral side using dual-screen views with identical settings. Echo intensity (grayscale) and stiffness in kPa (shear wave elastography) were analyzed
Results: Both methods showed values within a mean of 5% of the contralateral side in healthy participants and were feasible for sonographers with at least one year of experience. The standard views could be achieved by using a SOP with

defined anatomical landmarks. Absolute values showed significant variability between muscle groups and individuals. Echo intensity did not correlate with sex, hand dominance, or muscle stiffness. Pathological muscles exhibited increased echo intensity compared to healthy contralateral controls, while atrophied muscles showed decreased stiffness (mean 11.1 vs. 23 kPa). Elastography was highly sensitive to sonographic conditions, such as transducer contact seal quality and muscle contractile state, with pathological fibrillations reducing reliability. This extended the exam duration and increased the number of attempts, but by using the software quality control, a valid measurement could be achieved in all subjects. Conclusion: Grayscale analysis and elastography are both feasible adjuncts methods for quantifying muscle atrophy in a tertiary care setting. Given that both measure different qualities, they should be deemed complementary. Dual-screen imaging with contralateral comparisons using consistent landmarks improved reliability and mitigated device-specific variability in echo intensity analysis, which is a common point of critique. Elastography offered consistent stiffness measurements but required optimal sonographic conditions and had a steeper learning curve. Grayscale analysis provided reliable structural assessment but depended on off-device processing. Larger studies are needed to establish specific patterns of both modalities during re-innervation, possibly also adding different imaging modalities (e.g., MRI) or electrophysiological measurements.

Keywords: muscle atrophy, nerve injury, ultrasound, elastography, grayscale analysis

A-0720 VALUE BASED HAND SURGERY – A MODEL FOR FUTURE HAND SURGERY SERVICES?

Natalie Blessley-Redgrave[1], Hamish Laing[2], Dean Boyce[1]

[1]Welsh Centre for Burns and Plastic Surgery, UK; [2]Value-Based Health and Care Academy, School of Management, Swansea University, Wales UK

Introduction: Health systems face rising demand and resource constraints, exacerbated by the SARS-CoV-2 ("COVID-19") pandemic. Value-Based Healthcare (VBHC) prioritises the achievement of the outcomes that matter to patients at the lowest possible cost. There is increasing recognition that it is safe to perform appropriate surgical procedures outside of the traditional theatre setting without compromising outcomes. Hand surgical procedures are uniquely suitable for this. The British Society for Surgery of the Hand (BSSH) guidance supports performing specific hand surgical procedures in treatment rooms to increase capacity at lower cost, safely.

Aim: To establish how adoption of national BSSH guidelines for a transition from the traditional operating theatre to a procedure room environment could improve care and efficiency of hand surgery services

Material & Methods: The volume of hand surgery activity within Wales was analysed via a Welsh Hand Surgery Dashboard. Patient-Level Information and Costing Systems analysis (PLICs) established current operating costs & discovered significant regional variability. Subsequent Time Driven Activity Based Costing (TDABC) analysis of specific pathways assessed the potential cost and time savings from adoption of BSSH/GIRFT hand surgery guidelines for alternative operating environments.

Results: The Welsh Hand Surgery Dashboard details 56,500 hand operations performed since 2017. Up to 40% of these cases (>6000 cases/year) are suitable for procedure room operating.

Adoption of BSSH/GIRFT guidelines for carpal tunnel surgery alone, would result in cost savings of £550,000/year (at pre-COVID operating levels) and release of more than 1000 operating theatre hours and >13,000 person hours for alternative use.

If all suitable hand surgery cases across Wales were transitioned to procedure room operating the potential cost saving would be > £1million/year

Conclusions: Most routine hand surgery does not require a standard operating theatre environment. Moving appropriate procedures to a treatment room environment significantly reduces cost and releases precious NHS theatre resource for areas that desperately need it.
Extrapolating this data to wider hand surgery practice has the potential to free up countless thousands of staff hours, slashing departmental budgets and promoting Value Based Care.

A-0721 HOW EFFECTIVE IS DISTAL RADIUS BONE GRAFT IN ENCHONDROMA SURGERY? PRESENTATION AND OUTCOME IN ENCHONDROMAS OF HAND. A BARTS HEALTH EXPERIENCE

MR Z A CHAUDHRY, Miss Maria, Miss Soomin Jang, Grance BD, Mahad I, R Ragoowansi
Department of Plastic & Reconstructive Surgery, Barts Health, NHS trust, London, United Kingdom

Introduction: Introduction. An enchondroma is a benign cartilaginous tumor and arises from medullary cavity of hand and feet bones. It is a common benign bone tumor and account for 10-15 % of bone tumors. Most common in adolescents and young adults, with peak incidence between the ages of 10-30.
Most the patients are asymptomatic and may discover enchondroma incidentally.
Patients usually present with pain, swelling, deformity and fracture of bone.
Aim: How effective is distal radius bone graft in enchondroma surgery?
Presentation and outcome in Enchondromas of hand.
Material & Methods: Results: All our patient healed well and there was minimum donor side morbidity.
Conclusions: Enchondromas are common benign bone tumors and excision and bone grafting in symptomatic cases gives excellent results with minimum morbidity. No recurrence noted.

A-0722 GIDDINS FRAME-PUSHING THE BOUNDERIES IN THE MANAGEMENT OF FRACTURE DISLOCATION PIPJ FINGERS OF HAND. INDICATIONS, OUTCOME AND COMPLICATIONS

MR Z A CHAUDHRY, Plastic & Reconstructive Surgery, Royal London Hospital, London
Grance DB, Miss Emily, Sameen A, Zeynep, Unluer, RR, M Shibu
Plastic & Reconstructive Surgery, Royal London Hospital, London, Barts Health, NHS, Trust, UK

Introduction: Proximal inter phalangeal joints fracture dislocation are challenging for hand surgeons.Giddins frame is a dynamic specialised device used in the management of PIPJ fracture dislocations.This frame performs stable fixation and immobilization while offering controlled movements.This indirectly support rehabilitation and recovery
Aim: Expanding indications , out come and morbidity after Giddin s frame application in PIPJ fracture dislocation
Material & Methods: It is a retrospective study to assess the indications and outcome in different types of PIPJ fracture dislocations. Patient for the last 10 years are included in the study.
Patients included age more than 18,open or close fracture dislocations PIPJ,PIPJ fractures requiring additional k wires or screws.
K wires and frame were removed after 4 weeks and patients remined under hand therapy till recovery.
Giddins frame is simple frame and easily applied, provide dynamic stability, prevents stiffness and promotes functional recovery
Results: Out come was directly proportional to severity of injury. Simple fracture dislocation were associated with good

healing and good range movements. Complex injuries required more aggressive management
Conclusions: The Giddins frame , is an innovative tool used in the treatment of fractures and dislocations of PIPJ.It is a dynamic fixation and promotes healing and rehabilitation at the same time.
Proper application and management of the Giddin s frame can lead to improved outcome in recovering PIPJ function and patients satisfaction.

A-0723 OUTCOME AND MORBIDITY AFTER HEMI-HAMATE ARTHROPLASTY, IN PROXIMAL INTERPHALANGEAL JOINT FRACTURE DISLOCATIONS OF HAND. BARTS HEALTH EXPERIENCE

ZA Chaudhry, BD Grance, M Radhi, I Mhad, R Ragoowansi, M Shibu
Department of Plastic & Reconstructive Surgery, London.UK; Barts Health, NHS Trust, London, UK

Introduction: Proximal interphalangeal joint fracture dislocation can significantly impact the function of finger and over all hand performance. Among the treatment options ,hemi-hamate arthroplasty has emerged as a good option due to its potential for providing stable PIPJ while minimising complications.
Aim: Aim of the study is to evaluate the outcomes of hemi-hamate arthroplasty in patients with PIPJ P2 base fracture dislocation.
Our main focus is on functional recovery, pain relief and complication rate
Material & Methods: We have included patients with PIPJ P2 fracture dislocation, treated with hemi hamate arthroplasty during the last 10 years at Royal London Hospital, London.
Patient were included in the study after pre operative assessment including relevant history and focused examination, standard images followed by surgical intervention using standard hemi-hamate bone graft arthroplasty technique.
Pain scores, functional assessments using specific hand function scales and standard follow up by doing radiographs to assess the integration and position of bone graft.
Results: Graft take was good with some stiffness at PIPJ requiring prolong physiotherapy.
No residual morbidity seen at wrist level
Conclusions: Hemi hamate arthroplasty has emerged as a effective surgical option for managing PIPJ P2 base fractures, providing good outcome in terms of pain relief and functional recovery along with no donor site morbidity.

A-0724 USE OF THE MFC FLAP TO BRIDGE THE GAP IN CARPAL RECONSTRUCTION

F Pucci[1], J Charnock[2], P Hever[2], O Berber[2], D Nikkhah[2]
[1]University College London, UK; [2]Royal Free Hospital NHS Foundation Trust, London, UK

Introduction: Osseous non-union in the hand & wrist presents a challenge to the reconstructive hand surgeon. Conventional treatment options include rigid internal fixation with non-vascularised bone graft, local pedicled vascularised bone flap, and microvascular free bone flaps. The medial femoral condyle (MFC) flap is a versatile flap with reliable blood supply, good pedicle length, and ability to be harvested in various compositions, including as an osteochondral flap to reconstruct articular surface defects. It has been well described in the literature for scaphoid reconstruction following recalcitrant proximal pole non-union. Here we report our experience in the use of the MFC flap for carpal bone reconstruction.
Case series: We present our series of 5 patients in which the MFC flap was used to restore bony architecture, and thereby function, in cases of carpal bone avascular non-union (4 scaphoid, 1 capitate). Patient age in our series ranged from 17

to 54. Mean time from injury to surgery was 4.5 years. Combined procedures include partial wrist denervation and flexor tendon reconstruction secondary to attritional rupture from injury.
Results: Post-operative follow-up ranges from 6 weeks to 2 years. All patients demonstrated improvement in pain, and full functional use of hand, with evidence of osseous union on x-ray. There were no donor site complications reported. At 6 months all patients had full function, and no further operative intervention was required
Conclusions: We demonstrate the MFC flap to be a versatile flap that can successfully manage recalcitrant osseous avascular non-union in the carpus with good functional outcomes, and limited donor site morbidity. It is a reliable flap, with relatively short learning curve for successful flap raise.

A-0725 IPSILATERAL PREOPERATIVE CORTICOSTEROID INJECTION AND TIMING ARE NOT ASSOCIATED WITH INCREASED POSTOPERATIVE DEEP INFECTION RISK AFTER CARPAL TUNNEL RELEASE

Annika N. Hiredesai[1], Alejandro M. Holle[1], Ammon Driggs[1], Eugenia Lin[2], Jens T. Verhey[2], Cara Lai[2], Jonathan L. Jeger[3], Shelley S. Noland[4]
[1]Mayo Clinic Alix School of Medicine, Scottsdale, AZ; [2]Department of Orthopedic Surgery, Mayo Clinic, Phoenix, AZ; [3]Department of Plastic Surgery, Mayo Clinic, Phoenix, AZ; [4]Division of Hand Surgery, Department of Orthopedic Surgery, Mayo Clinic, Phoenix, AZ

Introduction: Prior literature reports an increased risk of postoperative infection when a corticosteroid injection (CSI) is given preoperatively before carpal tunnel release (CTR). However, there is considerable variation in the reported preoperative window associated with significant infection risk.
Aim: The aim of this study was to investigate the association between preoperative timing of corticosteroid injection and rate of postoperative deep infection requiring surgical intervention after CTR.
Material & Methods: Patient who had undergone endoscopic or open CTR were identified in a large administrative claims database. Exclusion criteria included concomitant hand procedure, age <18 years, unspecified or bilateral CTS, or insufficient postoperative data. Patients who received ipsilateral CSI within 90 days prior to CTR or no CSI were matched by age, sex, Elixhauser Comorbidity Index, hypertension, diabetes, obesity, rheumatoid arthritis, thyroid disorders, and tobacco use. Patients with a preoperative CSI were further stratified into those who received CSI 0-30 days, 31-60 day, and 61-90 days before CTR. Demographic variables between matched cohorts were compared using chi-squared or Kruskal-Wallis tests. Chi-squared tests were used to determine association between CSI timing on 30-, 60-, and 90-day postoperative deep infections requiring surgical intervention.
Results: Each matched cohort included 17,125 patients. No significant increase in postoperative deep infection risk was observed at 30, 60, or 90 days in the CSI cohort relatives to controls, regardless of CSI timing. Patients who underwent a preoperative CSI 61 – 90 days prior to CTR had a significantly lower risk of deep infection compared to matched controls with an infection rate of 0.13% vs. 0.34% (OR: 0.38; 95% CI: 0.18 – 0.81; $p = 0.01$).
Conclusions: The reported findings suggest that preoperative CSI, at all studied timepoints, was not associated with increased risk of postoperative deep infection, a divergence from existing literature. The primary endpoint of postoperative deep infection requiring surgical intervention focused on the patients who experienced substantial morbidity and costs. Hand surgeons should consider these findings when evaluating risks and benefits of non-surgical and surgical treatments for CTS patients.

A-0726 BOUTONNIERE DEFORMITY IN THE HAND BURNS

MR Z A CHAUDHRY, HASSAN,S,S ameen A, RRagoowansi. SIMON MYERS
Barts Health, NHS trust, London, UK

Introduction: Introduction: Burn injuries to the upper limb are common and have the potential to result in significant functional disability. Given the pivotal role of the hand in functional and cosmetic terms, optimal outcomes in treatment from the time of injury to rehabilitation are essential. [1]Depending on the surface involved, hand burns are divided into volar and dorsal, the latter being more frequent due to a variety of reasons. These include injuries sustained due to the reflex action of hand clutching in emergency situations, the frequent holding up of the hands to shield the face exposing the dorsal surfaces and the dorsal surface being more exposed to flashes, explosions and flames.
{1}
Boutonniere deformity, characterised by flexion of the proximal interphalangeal (PIP joint) and hyperextension of the distal interphalangeal joint (DIP joint), is frequently encountered in burns practice and its correction represents a complex problem. The incidence of these deformities is unknown however, they represent one of the most common post-burn deformities of the upper limb alongside web creep/syndactyly. Several techniques have been advocated in literature for post burns boutonniere correction.
Aim: To study different reconstructive options for Boutonniere defermity recontruction of fingers.
Material & Methods: Review of literature.Retrospective study.
Results: All techniques have different success rates
Conclusions: Success rate is different in different techniques.

A-0727 MANAGEMENT OF TOURNIQUET-RELATED NERVE INJURY (TRNI): A SYSTEMATIC REVIEW

Jeremy Chang[1], Laxminarayan Bhandari[2] , Joseph Messana[3] , Saud Alkabbaa[4], Alireza Hamidian Jahromi[5], Petros Konofaos[6]
[1]Internal Medicine, University of Tennessee Health Science Center, Memphis, USA; [2]Hand Surgery, Kleinert Kutz and Associates, University of Louisville, Louisville, USA; [3]Hand Surgery, Christine M Kleinert Institute of Hand and Microsurgery, Louisville, USA; [4]Plastic Surgery, King Fahad Armed Forces Hospital, Jeddah, SAU; [5]Plastic Surgery, Temple University Hospital, Philadelphia, USA; [6]Plastic Surgery, University of Tennessee Health Science Center, Memphis, USA
[1]Prince Sultan Military Medical City, Riyadh, Saudi Arabia

Introduction: Tourniquet-related nerve injuries (TRNIs) are a rare but feared complication of operative tourniquet use. While the literature contains multiple discussions regarding tourniquet use as well as reported cases of its complications, there does not exist a consensus guideline for a safe tourniquet pressure, application time, or management of TRNI.
Aim: This paper conducts a comprehensive review of the available literature for cases of TRNI with a specific focus on analyzing the management of cases of TRNI and their functional recovery.
Material & Methods: The study was conducted based on PRISMA 2020 guidelines. Articles were obtained through the US National Library of Medicine (NLM) database, and PubMed. The search was narrowed down by using keywords like “tourniquet,” “nerve injury,” “palsy,” and “paralysis.” We searched for the articles that included the above-mentioned keywords within their titles or abstract fields.
Results: One hundred nine articles were retrieved in a search of medical literature (PubMed) using the keywords: tourniquet, nerve injury, paralysis, and palsy. The initial search was further narrowed down to seven case series and 10 case reports totaling 203 reported cases of TRNI. Of the 203 cases, 64 cases involved upper extremity tourniquet use, and 139 cases involved lower extremity tourniquet use

Conclusions: Most patients (89.75%) experienced a complete recovery. TRNI may occur over a wide range of tourniquet application times and tourniquet pressures; hence, it is a necessity for surgeons to consider it as a potential complication and understand the methodology for diagnosis and long-term management.

A-0728 REVOLUTIONIZING HAND SPLINTING WITH 3D PRINTING: A NEW ERA OF CUSTOMIZATION AND REMOTE CAREN (VIDEO)

Maryam Farzad[1], Joy MacDermid[2,3,4], Louis Ferreira[5,6], O. Remus Tutunea-Fatan[5], Adam Gorski[5], Ajay Balaji[5], Steven Cuypers[7]
[1]Hand and Upper Limb Center, St. Joseph's Health Center, School of Physical Therapy, Department of Health and Rehabilitation Sciences, Western University, London, Ontario, Canada; [2]Physical Therapy and Surgery, Western University, London, ON, Canada; [3]Clinical Research Lab, Hand and Upper Limb Center, St. Joseph's Health Center, London, Ontario, Canada; [4]McMaster University, Hamilton, ON, Canada; [5]Department of Mechanical and Materials Engineering, Western University, Canada; [6]Department of Surgery, Western University, Canada; [7]Orfit Industries, Wijnegem, Belgium

Introduction: The advancement of 3D printing and mobile scanning technologies has the potential to transform the field of hand therapy, particularly in the fabrication of custom orthotic devices. Traditional methods of hand splinting often require multiple in-person visits for assessment, fitting, and adjustments, which can be burdensome for patients, especially those in remote areas or with mobility challenges. This study explores a comprehensive workflow integrating remote evaluation, mobile 3D scanning, and 3D printing to offer an innovative solution for remote custom hand splint fabrication
Aim: To evaluate the feasibility, accuracy, and clinical effectiveness of a remote workflow for hand splint fabrication that utilizes a custom web-based application for evaluation, mobile phone-based 3D scanning, and 3D printing technology to design and produce personalized splints
Material & Methods: The study involved developing a web-based application that allows therapists to remotely assess hand conditions, including range of motion (ROM), pain levels, and sensory function, by analyzing images captured via a mobile phone camera. These images were processed into a 3D mesh model, which was used to design custom splints. Based on evaluation data, therapists used advanced design software to reposition finger joints and optimize the splint fit. The final splint models were converted into STL files and 3D printed using a modified thermoplastic material. The accuracy of the workflow was assessed by comparing the mobile scans with traditional photogrammetry scans and evaluating the fit and comfort of the printed splints
Results: The web application demonstrated high validity in evaluating hand function, with results closely aligning with traditional in-person assessment methods. The mobile scanning process produced highly accurate 3D models with a root mean square error (RMSE) of less than 0.5 mm, comparable to established photogrammetry methods. Surface deviation analysis showed that the custom 3D-printed splints offered a better fit and comfort than traditional splints, with surface deviations reduced by more than 50%. The printing process was efficient, with reduced production time compared to manual fabrication
Conclusions: Integrating mobile scanning, web-based evaluation, and 3D printing technology in hand splint fabrication offers a promising solution for remote hand therapy. The workflow provides accurate, customized splints that significantly improve fit, comfort, and patient outcomes. This approach enhances accessibility, reduces treatment time, and provides a scalable solution for clinicians, particularly in underserved populations. The findings demonstrate the potential of 3D printing and remote care to revolutionize hand splinting, making it more efficient, accessible, and patient-centric.

A-0729 RAISING STANDARDS IN HAND TRAUMA THROUGH COLLABORATVE NETWORKS

Sarah Tucker
John Radcliffe Hospital, Oxford, UK

Introduction: The British Society for Surgery of the Hand (BSSH) has defined standards of care for hand trauma. They are acknowledged by clinicians as being a standard of care they would aspire to, but it can become demoralising when there is little support for the changes needed to deliver them. The Royal College of Surgeons used a Quality Improvement collaborative called Handsfirst to support hand surgeons and hand therapists to analyse their service and make effective changes.
Aim: To improve the delivery of treatment for hand trauma with a specific project goal that 80% of hand trauma patients would have their surgery within the defined timeframes of the BSSH trauma standards.
Material & Methods: Phase One started in Autumn 2021 and a total of 26 hand trauma units participated in the Collaborative programme, which extended over 2 years. Each unit had a project lead with a team consisting of surgeons, therapists, and administrative staff. They were provided with a secure database to input their patient data to measure compliance with the standards, and had regular meetings with a Quality Improvement Consultant. Over the 18 months there were 3 face to face meetings and 3 webinars hosted for the whole network. The approach used was to foster the exchange of ideas and provide the tools to implement change.
A website for clinicians to share their care pathways and successful business cases allowed these resources to be used by other clinicians to improve their own services.
Results: The collaborative data has resulted in the largest known British National Database on Hand Trauma.
Standard 1 Open joints and fractures, time from injury to wound closure – 24 hours. Compliance improved by 28% to attain 63%.
Standard 2 All other open wounds, time from injury to operation – 96 hours.
Compliance with this saw a smaller improvement of 2%, and it reached 80%. There were also fewer patients who waited excessive times (>250 hours) with reduced variability in practise.
Standard 3 Closed fractures, time from injury to surgery – 7 days.
Compliance improved by 8%, and the mean average waiting time fell by 30 hours.
The factors that predicted success in achieving the targets was analysed and a report has been published. This has provided all hand trauma surgeons with the information on how to build a better service.
In addition to the tangible improvements, feedback from participants highlighted the improved morale and co-operative working across disciplines. Collaborative relationships with administrative staff were stronger and many departments had successfully gained an increase in resources available to them as a result.
The second round of the collaborative has added in hand therapy standards and the analysis from this will also be presented.
Conclusion: Hand surgeons are driven by the desire to improve the standards of care for trauma patients. Providing a collaborative network is a relatively low cost intervention that is effective in disseminating good practise.

A-0730 SPONTANEOUS RUPTURE OF THE COMMON EXTENSOR TENDON OF THE FINGERS IN THE FOURTH COMPARTMENT

Catarina Rodrigues, Sónia Rodrigues, Pedro Chaves, Ricardo Teixeira, Raquel Marques, Amílcar Valverde
[1]*Unidade Local de Saúde do Médio Tejo, Abrantes, Portugal*

Introduction: Spontaneous rupture of the common extensor tendon in the hand has been reported in association with conditions such as Kienbock's disease, rheumatoid arthritis, and distal radius fractures.

Aim: The aim of this case report is to describe a rare case of a complication following ligamentoplasty
Material & Methods: We present the case of a 27-year-old woman, an operational assistant, who presented to the emergency department with an inability to actively extend the third and fourth fingers of her dominant hand, after hearing a popping sound. She had no significant trauma and didn´t report pain. The patient had no identificable risk factors, such as rheumatic disease or chronic joint conditions, but had a history of recent arthroscopic repair of the lunotriquetral ligament.
On physical examination, scars were noted on the dorsal surface of the wrist, consistent with previous surgery. There were no signs of inflammation. The patient had full passive range of motion but limited active extension of the third and fourth fingers.
After clinical suspicion of tendon involvement, an X-ray and ultrasound were requested. The X-ray showed no signs of acute osteoarticular injury. The ultrasound revealed patency of the degenerated extensor indicis proprius (EIP) and the absence of the common extensor tendon (ECP), with no identification of the proximal stumps, but with the distal stumps located in zone 5.
Results: The surgery was scheduled and performed eight days after the diagnosis. A tourniquet was applied, an axillary block was performed, and a classic dorsal approach was used. The fourth compartment was opened and an anchor with pull-out migration into the fourth compartment was identified. There was no common extensor tendon (ECD) and a degenerative extensor indicis proprius tendon (EIP) was found. Proximal and distal stumps of the ECD of the third and fourth fingers were identified with a 7 cm and 4 cm gap, respectively, and no possibility of direct repair. A tendon autograft was chosen for repair, using the palmaris longus (PL) and hemi-flexor carpi radialis (HemiFCR) tendons. A splinting cast was applied in a functional position of the wrist for 4 weeks. It was removed after 4 weeks, and the patient began self-rehabilitation. At 2 months, the patient was pain-free with full range of motion and had returned to activities of daily living. The Disabilities of the Arm, Shoulder and Hand (DASH) score was 22
Conclusions: When the cause of extensor tendon ruptures of the hand is unclear, differential diagnoses such as Kienböck's disease (KD) and rheumatoid arthritis (RA) must be excluded. Thorough history and physical examination, along with diagnostic imaging like, X-rays and ultrasound, must always be performed to better characterize the disease process allowing for a more accurate pre-operative diagnosis.

A-0731 ANATOMICAL STUDY FOR A NOVEL TECHNIQUE OF NERVE TRANSFER IN CASE OF HIGH ULNAR NERVE INJURY

Paolo Titolo[1], Andrea Fanecco[2], Alessandro Crosio[1], Erica Cavalli[3], Francesca Vincitorio[4], Giulia Colzani[1], Michele Rosario Colonna[5], Bruno Battiston[1]
[1]Hand Surgery, Reconstructive Microsurgery, CTO, Torino, Italy; [2]Hand Surgery Department, Ospedale San Paolo, Savona, Italy; [3]Plastic Surgery Department, Ospedale San Gerardo, Monza - Italy; [4]Neurosurgery Department, CTO, Torino, Italy; [5]Plastic Surgery Department, Ospedale Martino, Messina, Italy

Introduction: The Ulnar Nerve is a frequent site of peripheral nervous system damage located in the upper extremities, and the resulting motor deficits can severely impact hand function.
Grip functions are not only important in work and sports but, more importantly, in daily life; the muscles innervated by the ulnar nerve are the most involved in performing such gestures.
Not all muscles involved in hand grip functions have received equal attention in the development of new nerve transfer techniques, particularly the flexor digitorum profundus muscle innervated by the ulnar nerve, which is of paramount importance.

Aim of the study: This study aims at the anatomical description on cadaver of a new nerve transfer technique for recovery of grip function in high ulnar nerve injury.
Methods: In the described technique the motor branch of the pronator teres muscle (innervated by the median nerve) is transferred to the motor branch of the ulnar nerve for the flexor digitorum profundus.
An anatomical dissection was performed on No. 6 cadavers evaluating the characteristics of both nerves and comparing the data obtained with the most recent anatomical studies; nerve transfer was also performed on the cadavers studied to assess the feasibility of this new surgical technique.
Results: The results collected on cadavers are encouraging and allow us to state that a new technique of nerve transfer from the median nerve to the ulnar nerve at the elbow and forearm is not only feasible but also safe and relatively easy to perform.
Conclusions: Although peripheral nerve injuries remain debilitating and difficult-to-treat pathologies, innovations in surgical treatment, particularly in the use of nerve transfers, have enabled previously unhoped-for results; we propose this new nerve transfer technique in the context of triple neurotization for the ulnar nerve for the recovery of skin sensation, intrinsic and extrinsic finger muscles.
We hypothesize that this new nerve transfer technique may further improve motor function and hand strength in this category of patients in the future.

A-0733 COMPLEX PIP JOINT FRACTURES TREATED WITH PINS AND RUBBER BAND TRACTION: A RETROSPECTIVE STUDY OF THE OUTCOME AFTER A PIP FRACTURE

Louise Stenhem, Minhaal Hussein, Hans-Erik Rosberg, Magnus Flondell
Department of Hand Surgery, Skåne University Hospital, Malmö, Sweden, Department of Translational Medicine - Hand Surgery, Lund University, Malmö, Sweden

Introduction: Proximal interphalangeal (PIP) joint fractures often result in reduced hand function, both regarding strength and range of motion. Several methods exist to to treat these PIP joint fractures, both surgical and non-surgical. Despite this the outcomes can be discouraging. The pin and rubber traction system, first described by Suzuki, may offer a reliable outcome for PIP fractures.
Aim: This study aims to further investigate the outcome of the PRTS in relation to function and pain, by comparing the outcome and complications in intraarticular PIP joint fractures that have been treated with this system.
Material & Methods: 37 individuals were treated with the PRTS during the years 2014–23. 11/34 patients came in for a clinical examination. 24/34 persons did a phone interview, we were unable to contact 10/34.Additionally we administered q-DASH, CISS and EQ-5D questionnaires
Results: Our results indicate that participants had little to no pain more than a one year after the PRTS treatment, reflected both in the phone interview's median verbal self-rating,satisfaction rating was 7 (IQR) 5-9). The median pain rating at rest and during activity, were 1 (IQR 1-1) and 1 (IQR 1-2), respectively. ROM was reduced in both the PIP and DIP joint of the injured vs non-injured hand. The median loss of ROM was 30° (IQR 15-60°) in the PIP joint and 60° (IQR 15-75°) in the DIP joint. The quickDASH score was a median of 14 (IQR 5-34)
Conclusions: Despite a decreased aROM and raised quickDASH score the participants have high satisfaction ratings measured and low pain rating. Cold sensitivity and general perception of low health have worse outcome.

A-0735 TARGETED MUSCLE REINNERVATION INTO LUMBRICAL MUSCLES FOR TREATING SYMPTOMATIC DIGITAL STUMP NEUROMAS

Olga Politikou, Michael Wirth, Martina Greminger, Inga Besmens, Maurizio Calcagni
University Hospital of Zurich, Zurich, Switzerland

Introduction: The treatment of painful digital stump neuromas is challenging, and the ideal approach to this complex problem remains controversial. Targeted muscle reinnervation (TMR) is gaining ground not only for the prevention of neuropathic and phantom limb pain in limb amputations but also as a treatment.
Aim: In this work, we present a detailed description of the surgical technique of TMR into the lumbrical muscles for treating painful digital stump neuromas, supported by graphic illustrations, surgical pictures, and videos. Additionally, we present our one-year follow-up of four symptomatic digital stump neuromas treated with this technique.
Material & Methods: We begin by dissecting the nerve to the lumbrical muscle in the palm, ensuring we do not exceed the 20-minute tourniquet time for nerve stimulation. The motor entry point is located 18-20 mm proximal to the A1 pulley of the middle finger and enters the muscle from its medial/dorsal side. We verify its location with handheld stimulation and mark it with a vessel loop. Following this, the digital nerve of the stump is dissected up to the level of the dorsal nerve branch at the metacarpophalangeal joint. Intraneural neurolysis can be performed from distal to proximal over one centimeter to preserve the dorsal branch and reach the target. The recipient nerve is transected about 8 mm proximal to the motor entry point. Tension-free coaptation without size discrepancy is achievable. The coaptation site is sealed with fibrin glue, and the nerve is blocked with a perineural injection of Ropivacaine 1%.
Results: At 1-year follow-up, all patients reported complete permanent pain relief in the stump area and slight pain in the palm only during strong grip with a numeric rating scale (NRS) of 3-4.
Conclusions: TMR offers a promising alternative in treating digital stump neuromas by redirecting axonal growth from sensory nerves to motor endplates, potentially preventing neuroma recurrence and enhancing patient outcomes. Randomized comparative studies are needed to validate these findings.

A-0736 COGNITIVE NERVE TRANSFERS FOR SPASTICITY TREATMENT IN UPPER MOTOR NEURON SYNDROME

Olga Politikou, Anna Boesendorfer, Florian Jaklin, Agnes Sturma, Oskar C. Aszmann
Medical University of Vienna

Introduction: Stroke is nowadays a leading cause of disability with devastating sequelae. Nevertheless, not all the muscles are equally affected, as some may turn spastic or paretic and other remain intact. This unique pathophysiological mosaic dictates a precise therapeutic plan. A life-lasting treatment, precisely adapted to every single patient's needs and to disease pattern, is currently missing. Hyperselective muscle denervation and subsequent cognitive reinnervation with appropriate donor nerves may break the pathological spastic circuit and provide volitional muscle control.
Aim: We performed cognitive nerve transfers in stroke patients and prospectively investigated their effects on clinical and functional level.
Material & Methods: To provide volitional muscle control of finger flexors and wrist/fingers extensors we transferred the nerve branch to brachialis muscle to the anterior interosseous nerve and the nerve branch to the lateral head of triceps to the deep radial nerve in a total of ten hemiplegic patients. We additionally reinnervated the spastic pronator teres muscle with a branch to the pectoralis major muscle using a vascularized graft. Supplementary surgical steps were performed as needed. Nerve donors had always been carefully selected with a minimum of M4 strength. Clinical and functional outcomes are evaluated at 12 and 24 months after surgery.

Results: The 24-month follow-up revealed an improvement in all clinical and functional scores with statistical significance ($p<0.05$) for DASH and modified Ashworth scale. The reinnervated finger and thumb flexors and pronator teres reached a volitionally controlled M3 strength without recurrence of spasticity. Outcomes for wrist/finger extension were poorer with M2 strength.
Conclusions: Cognitive muscle reinnervation through selective nerve transfers reduces spasticity and offers the possibility for permanent biological restoration of hand function in stroke patients.

A-0737 RESPONSIVENESS AND CLINICALLY IMPORTANT DIFFERENCES OF THE WESTERN ONTARIO ROTATOR CUFF (WORC) INDEX IN SURGICAL AND NON-SURGICAL TREATMENT GROUPS WITH DIFFERENT FOLLOW-UP PERIODS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Maryam Farzad, Hassan Jafari,Joy macDermid, Milad Attaeian
School of Physical Therapy, Department of Health and Rehabilitation Sciences, University of Western Ontario, London, Ontario, Canada

Introduction: This study reviews and meta-analyzes the responsiveness and minimal clinically important difference (MCID) of the Western Ontario Rotator Cuff (WORC) Index for various patient populations and treatment durations.
Methods: A comprehensive search in PubMed, Embase, Web of Science, and CINAHL identified studies on the responsiveness or MCID of the WORC in shoulder conditions. Two authors independently screened articles. Study quality was appraised using COSMIN and GRADE guidelines. Responsiveness was evaluated using anchor-based MCID and distribution-based standardized mean differences (SMD) computed with Hedges' g. A random-effects model addressed study variability, and heterogeneity was assessed with the Chi-squared test and I^2 statistic.
Results: The 12 studies yielded high-quality evidence supporting the WORC's responsiveness. A meta-analysis of 1326 observations revealed a significant overall effect size (SMD) of 0.91 (95% CI: 0.56 to 1.26; $p < 0.0001$), with high heterogeneity ($I^2 = 91.2\%$). Subgroup analyses showed larger effect sizes for long-term follow-ups (SMD = 1.28) and surgical treatments (SMD = 1.14). The average MCID was 17 for conservative treatments within six months, 26 for surgical procedures, and 29 for follow-ups over six months.
Conclusion: The WORC measures improvements in rotator cuff conditions, with varying MCID values for different treatments and durations.

A-0738 SURGICAL MANAGEMENT OF DISTAL RADIUS RIM FRACTURES

Hagay Orbach[1,2], Guy Rubin[1,2]
[1]Emek medical center, Afula, Israel; [2]Faculty of medicine, Technion, Hifa, Israel

Introduction: The term distal radius rim fracture (DRRF) is used to describe marginal fracture of the distal radius articular surface rim. Although relatively small, the fragments contains multiple ligaments attachments therefore potentially destabilising the carpus and frequently associated with radio-carpal fracture dislocation. DRRF are rare and surgical treatment can be challenging.
Aim: To describe surgical approaches, fixation techniques, and hardware coverage options for DRRF including volar rim fracture, dorsal rim fracture and radio-carpal fracture dislocation.
Material & Methods: A retrospective study was performed and data regarding patients treated surgically for DRRF was collected. Surgical technique clinical and radiographic outcomes were evaluated.

Results: Two hundred thirty four radius fractures were surgically treated by a single surgeon in "Emek" medical centre hand unit between January 2020 to October 2024. Of which, 21 were DRRF. Surgical approach was dictated by the fracture configuration and the preplanned fixation technique. For volar approach, routine modified flexor carpi radialis approach or extend approach to the palm including carpal tunnel release was chosen. Dorsal approach was performed via 3rd or 5th extensor compartment. Fixation techniques were either dorsal rim plate (8 patients), volar rim plate (7 patients), cannulated screws (8 patients), Kirshner wires & cerclage (1 patient) or a combination of 2 techniques. Local flap coverage was performed in 6 cases in order to prevent tendon injury. No patients had loss of fixation or evidence of carpal subluxation. Three patients required hardware removal. There were no cases of tendon rupture. Radiographic measurements revealed good maintenance of volar tilt, radial inclination, and mean ulnar variance. There were no major complications related to the implant and all fracture sites presented full union.
Conclusions: DRRF is surgically challenging and various techniques should be used in order to achieve satisfactory clinical and radiological results.

A-0739 A COMPARISON OF LUNATE TYPE I AND II KINEMATICS IN HEALTHY WRISTS AND WRISTS WITH SCAPHOLUNATE LIGAMENT INJURIES

E.H.S. Teule[1,2], M. Haenen[1,3,4], S. Hummelink[1], E.P.A. van der Heijden[1,4]
[1]Department of Plastic Surgery, Radboudumc, Nijmegen, the Netherlands; [2]Orthopaedic Research Lab, Radboudumc, Nijmegen, the Netherlands; [3]Department of Radiology, Radboudumc, Nijmegen, the Netherlands; [4]Department of Plastic Surgery, Jeroen Bosch Hospital, 's-Hertogenbosch, the Netherlands

Introduction: Dynamic Computed Tomography (CT) is an emerging imaging modality that enables non-invasive kinematic analysis of wrist motion, offering new insights into the complex biomechanics of the wrist. Dynamic CT has potential to diagnose scapholunate (SL) ligament injuries associated with kinematic changes. However, the influence of lunate morphology (type I or II) on wrist kinematics remains unclear.
Aim: This study aimed to compare wrist kinematics in lunate type I and type II in both healthy wrists and those with SL ligament injuries, using dynamic CT imaging.
Material & Methods: Dynamic CT scans of healthy wrists and wrists with arthroscopically confirmed Geissler IV SL injury (SL4) were acquired. Imaging included a static CT scan and dynamic imaging scans during wrist radial-ulnar deviation (RUD) and flexion-extension (FE). Lunate type was classified on the static CT scan. Carpal bones were segmented in each scan using an artificial intelligence-based algorithm. Subsequently, 5 kinematic parameters were automatically extracted for each wrist position: sagittal capitolunate (CLA), scapholunate (SLA), radiolunate (RLA), and radioscaphoid (RSA) angles and the 3D scapholunate distance (SLD). A linear mixed model was used to compare these parameters between lunate types in the healthy and SL4 group.
Results: 73 healthy wrists (48 type I, 66%) and 22 SL4 wrists (13 type I, 59%) were analyzed. In healthy wrists, type II lunates exhibited a significantly larger CLA during ulnar (mean difference: 6.58°, 95% CI: 0.35–12.81, $p = 0.04$) and radial deviation (mean difference: 7.18°, 95% CI: 1.07–13.28, $p = 0.02$). In the SL4 group, type II lunates showed a significantly larger RSA during radial deviation (mean difference: 9.07°, 95% CI: 0.06–18.07, $p = 0.05$). No other kinematic parameters differed significantly between lunate types.
Conclusions: Automated dynamic CT based analysis revealed minor kinematic differences between lunate types I and II in both healthy and SL injured wrists, primarily during RUD. These findings suggest lunate morphology may influence wrist kinematics during RUD, but is less relevant during FE. While the large dataset of healthy wrists strengthens the

analysis, future studies should focus on expanding the dataset of SL injured wrists, exploring the clinical relevance of lunate type for these types of wrist injuries.

A-0740 NERVE TRANSFER FOR DISTAL CERVICAL SPONDYLOTIC AMYOTROPHY

Akira Hara, Satoshi Ichihara
Juntendo University Urayasu Hospital, Urayasu, Japan

Introduction: Distal cervical spondylotic amyotrophy (Distal CSA) is a rare form of cervical spondylosis that causes muscle weakness of the upper extremities, which is mainly caused by C8 anterior root lesion or C8 anterior horn impairment and shows muscle weakness both representing status resembling a posterior interosseous nerve (PIN) palsy and resembling an ulnar motor nerve palsy with no or minimal sensory signs. Because the supinator muscle is mainly innervated by C6 root and is intact in the distal CSA. We hypothesized the treatment of distal CSA as supinator motor nerve transfer to the PIN for the drop finger.
Aim: To validate the efficacy of nerve transfer of supinator to PIN for distal CSA.
Material & Methods: We have two cases (71-year-old male and 50-year-old male) of distal CSA. The Modified Medical Research Council scale was evaluated preoperatively. In case 1, ECU, EDC, EIP, EPL, and EDM were M0-1 while FCU, FDI, and ADM were M5 with no sensory disturbance. Idiopathic PIN palsy was suspected and PIN neurolysis at the elbow was performed at 6 months from the onset, but PIN was normal findings on the operation, then no remarkable change was seen. Aa a cervical MRI showed spur formation on the right side at C7/T1 level, CSA was diagnosed. In case 2, ECU, EDC, EPL, and EDM were M2-, EIP, FCU, FDI, and ADM were M3 with slight numbness on the C8 area of the left forearm. As the cervical MRI showed spur formation on the left side at C7/T1 level CSA was diagnosed. Because both cases represented severe PIN-like palsy we performed nerve transfer. After the supinator muscle contraction was confirmed by electric stimulation of the supinator nerve the supinator nerve transfer to the PIN was performed in an end-to-end fashion in case 1 at 10 months and an end-to-side supercharge fashion in case 2 at 6 months respectively after the onset.
Results: In case 1, some signs of recovery were seen over the year after surgery, and finger extension became possible in 3 years. In case 2, finger extension became possible in 11 months after the operation.
Conclusions: Nerve transfer might be hesitant to be performed in elderly patients because of aging, but this is one of the choices to treat this situation. Nerve transfer of the supinator nerve to PIN is useful for the drop finger in distal CSA.

A-0741 THUMBS UP TO BETTER CARE: HOW A SIMPLE LEAFLET IS HELPING RHIZARTHROSIS PATIENTS TAKE CONTROL

Raquel Maroto-Rodríguez[1], Paola Barrera Veloza[2], Maria Tibau Alberdi[1], Mercè Font Bilbeny[1], José Sánchez González[1], Nieves Allué Fernández[2]
[1]Hand Surgery Department. Consorci Sanitari del Maresme, Mataró, Barcelona, Spain; [2]Rehabilitation Department. Consorci Sanitari del Maresme, Mataró, Barcelona, Spain

Introduction: Rhizarthrosis, a degenerative condition affecting the thumb carpometacarpal joint, is one of the most common causes of hand disability in older adults. It primarily affects women over the age of 65, with symptoms including pain, inflammation, reduced hand strength, and functional impairment. Non-surgical management plays a critical role in alleviating symptoms and delaying disease progression. Recognizing the need for improved patient education, we developed an informational leaflet as part of a multidisciplinary effort between the Rehabilitation and Traumatology departments to guide patients in effective conservative management of rhizarthrosis.

Aim: To evaluate the impact of an informational leaflet on patient adherence to conservative management strategies for rhizarthrosis, its effectiveness in improving symptoms, and its role in involving patients in the management of their condition. Additionally, to assess the utility of distributing the leaflet through primary care centers to reach patients at their first point of contact with the healthcare system.
Material & Methods: An educational leaflet was designed and distributed to over 3,500 rhizarthrosis patients treated annually at the Consorci Sanitari del Maresme. The leaflet provided detailed instructions on splint use, therapeutic exercises, lifestyle modifications, and pain relief techniques. Distribution was coordinated across primary care centers to ensure patients could access the resource early in their healthcare journey. Patient outcomes, including self-reported pain levels, hand functionality, and surgical referrals, were monitored. Feedback on the leaflet's utility was collected to assess its practicality, patient engagement, and its ability to foster a sense of participation in their care.
Results: The leaflet significantly enhanced adherence to conservative management strategies, largely due to its clarity and practical advice. Approximately 80% of patients reported improved symptom control, with reduced pain and enhanced hand functionality. Splint use effectively stabilized the joint, while exercises improved strength and mobility. Lifestyle adjustments, such as alternating hand use and reducing strain on the thumb, further alleviated symptoms. Surgical intervention was necessary in 25% of cases, demonstrating the efficacy of non-surgical approaches in delaying or avoiding surgery for the majority of patients. Patients and primary care professionals highlighted the leaflet's value in engaging individuals with their condition and fostering self-management. This collaborative, multidisciplinary approach improved patient outcomes while strengthening the integration of primary care and specialized services.
Conclusions: The introduction of an informational leaflet, developed as part of a multidisciplinary collaboration between Rehabilitation and Traumatology teams, has proven to be an effective tool in the conservative management of rhizarthrosis. By empowering patients with knowledge and fostering active participation in their care, it has improved symptom control, enhanced functional outcomes, and reduced the immediate need for surgical interventions in many cases. The distribution through primary care centers ensures accessibility at the earliest stages of the healthcare pathway. This initiative underscores the importance of patient education and multidisciplinary collaboration in managing degenerative conditions and serves as a model for similar efforts in other chronic diseases. Future efforts will focus on expanding the resource, integrating digital formats, and further strengthening the link between primary and specialized care services

A-0742 BIG TROUBLE IN THE SHOULDER: TACKLING A GIANT LIPOMA WITH A SURGICAL WIN

Raquel Maroto-Rodríguez, Maria Tibau Alberdi, Andrés Pérez Prieto
Upper limb department. Consorci Sanitari del Maresme, Mataró, Barcelona, Spain

Introduction: Lipomas are the most common benign soft tissue tumors, characterized by their slow growth and asymptomatic nature. While lipomas can arise anywhere in the body, large lipomas (>5 cm) located in specific anatomical regions, such as the shoulder, are rare. These atypical cases often pose unique clinical challenges due to their size, potential compression of neurovascular structures, and associated functional impairments. Advanced imaging techniques, such as magnetic resonance imaging (MRI), play a crucial role in accurately diagnosing and planning surgical management for these lesions. Surgical excision remains the treatment of choice, offering symptom relief and preventing further complications.
Aim: To describe the diagnostic approach, surgical management, and clinical outcomes in a patient with a large lipoma located in the shoulder.
Material and Methods: We report the case of a 69-year-old woman who presented with a progressively enlarging left shoulder mass. Clinical examination, advanced imaging, and electromyography (EMG) were employed to assess the

tumor's characteristics and its impact on surrounding structures. The surgical excision was performed with the patient in lateral decubitus, using a posterior approach directly over the tumor. Postoperative clinical follow-up was conducted over a period of 3 months to assess functional recovery and monitor for recurrence.
Results: The patient initially presented with paresthesias and motor deficits affecting the median and ulnar nerves. Physical examination revealed a palpable, non-tender mass in the posterior compartment of the left shoulder. MRI demonstrated a well-defined, encapsulated intermuscular lipomatous lesion measuring 77x40 mm, located between the posterior deltoid, infraspinatus, and teres minor muscles. The mass showed complete fat saturation with no signs of edema or muscle atrophy in adjacent structures. EMG confirmed reduced ulnar nerve amplitudes in the forearm, though conduction velocities were preserved. Surgical excision of the tumor was successfully performed under general anesthesia. The procedure involved meticulous dissection to preserve neurovascular structures, with complete removal of the lipoma achieved without complications.
Postoperatively, the patient reported immediate resolution of paresthesias and gradual recovery of motor function. At the 3-month follow-up, she demonstrated full range of motion in the shoulder, no residual symptoms, and no evidence of recurrence on physical examination. Distal neurovascular status remained intact, and the surgical wound healed without complications.
Conclusion: This case underscores the importance of considering large lipomas in the differential diagnosis of slow-growing masses, particularly in atypical locations such as the shoulder. Early diagnosis facilitated by advanced imaging, combined with meticulous surgical planning—including careful patient positioning and the selection of an appropriate surgical approach—can lead to excellent functional outcomes. This case also highlights the critical role of interdisciplinary collaboration in managing complex cases involving neurovascular structures. Further research is warranted to investigate long-term recurrence rates and outcomes for large lipomas in challenging anatomical regions.

A-0743 BIG PROBLEMS IN SMALL SPACES: GIANT LIPOMAS IN THE FIRST WEB SPACE

Raquel Maroto-Rodríguez, Mercè Font Bilbeny, Miguel Picallo Fernández
Hand Surgery department. Consorci Sanitari del Maresme, Mataró, Barcelona, Spain

Introduction: Giant lipomas, defined as benign adipose tissue tumors larger than 5 cm, are rare in the hand but can cause significant functional impairment, sensory disturbances, and aesthetic concerns. Diagnosis is primarily radiological, with magnetic resonance imaging (MRI) providing superior accuracy in identifying benign features. Surgical excision is the treatment of choice, particularly for symptomatic cases. We present two cases of giant lipomas in the first web space and thenar eminence, discussing clinical presentation, imaging findings, surgical management, and outcomes.
Aim: To report and compare the clinical presentation, diagnostic approach, surgical techniques, and outcomes of two cases of giant lipomas in the hand.
Materials and Methods: Case 1: A 70-year-old woman presented with a slow-growing mass in the first web space of her left hand, with associated dysesthesias and a positive Tinel sign at the thumb. MRI revealed a well-defined lipomatous lesion measuring $55 \times 43 \times 33$ mm, consistent with a probable lipoma. Surgical excision was performed through a dorsal approach. Histopathological analysis confirmed a benign lipoma.
Case 2: A 79-year-old woman reported a painless, slow-growing mass in the thenar eminence of her left hand, with no associated sensory or motor deficits. MRI showed a well-defined, oval-shaped lesion measuring $55 \times 42 \times 18$ mm, hyperintense in T1 and T2 sequences, consistent with a lipoma. Surgical excision was conducted through a volar approach, revealing a non-adherent lipomatous mass. Histopathology confirmed the diagnosis of a benign lipoma.

Results: In both cases, surgical excision was completed without complications. Postoperative assessments showed excellent functional recovery with complete range of motion (ROM) and preserved strength, comparable to the contralateral hand. Both patients demonstrated intact distal neurovascular function and satisfactory wound healing. Histological analysis confirmed benign lipomatous tissue in both cases. No recurrence was observed during follow-up.
Conclusion: Giant lipomas of the hand, though rare, may lead to functional impairment and sensory disturbances, particularly in critical anatomical locations such as the first web space and thenar eminence. MRI is essential for accurate diagnosis and preoperative planning. Surgical excision provides excellent outcomes with minimal complications, as demonstrated in these two cases. Early recognition and management are crucial for optimal functional and aesthetic results.

A-0744 THE HIGHER INCIDENCE OF FROZEN SHOULDER IN BREAST CANCER PATIENTS: A SYSTEMATIC REVIEW

Alireza Mirahmadi, Shayan Amiri
Iran University of Medical Sciences, Tehran, Iran

Introduction: Breast cancer (BC) is a prevalent malignancy impacting women globally, leading to long-term complications that affect survivors' quality of life. Frozen shoulder (a.k.a. Adhesive Capsulitis of Shoulder (ACS)) is characterized by pain, stiffness, and decreased range of motion in the shoulder joint. Although ACS can occur spontaneously or as a result of various underlying conditions, emerging evidence suggests a potential relationship between breast cancer and the development of a frozen shoulder. Understanding the nature of this relationship is essential, as it may have implications for managing breast cancer and preventing ACS. This systematic review investigates the relationship between breast cancer and frozen shoulder, aiming to explore the prevalence, risk factors, diagnosis, proper treatment choice, and clinical implications of this association.
Methods: Utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards, the study conducted a comprehensive search of PubMed, Scopus, Web of Science, Google Scholar, and Embase databases in October 2023. Studies on breast cancer patients with frozen shoulders were included (Figure 1). Two reviewers employed the Newcastle-Ottawa Scale (NOS) and Cochrane risk-of-bias tool for randomized trials (RoB 2) for methodological assessment. Two senior reviewers blindly collected relevant data, and the third one confirmed the data
Results: Ultimately, 16 studies were included, involving 210,904 patients, conducted between 2012 and 2023. The prevalence of ACS in patients with a history of breast cancer (BC) surgery was reported as 20-65% . Various risk factors for developing ACS after BC have been identified, enabling the possibility of identifying the likelihood of ACS in these patients and even taking preventive measures. These factors can be classified into patient-related, surgery-related, and cancer treatment-related factors .
Patient-related risk factors, such as age, BMI, cancer stage, and diabetes history, were not related to a higher rate of ACs in these patients. Surgery-related factors, such as breast reconstruction, presence of lymphedema, and lymph node dissection, were identified as primary risk factors for ACS development. Cancer treatment-related factors such as chemotherapy, radiotherapy, and hormonal therapy were mentioned as potential contributors.
Discussion and Conclusion: Overall, this study underscores the link between breast cancer and ACS, with mastectomy with reconstruction identified as a key risk factor for ACS development. The utilization of advanced surgical tools is proposed to mitigate the risk of ACS. Various interventions, encompassing both non-invasive and invasive approaches, have demonstrated efficacy in enhancing range of motion (ROM), quality of life (QOL), and pain management in individuals with ACS. The findings emphasize the importance of tailored treatment approaches for ACS in breast cancer survivors.

A-0745 SYNERGISTIC EFFECTS OF COLCHICINE AND BORTEZOMIB ON INFLAMMATORY MARKERS AND CARTILAGE INTEGRITY IN OSTEOARTHRITIS

Alireza Mirahmadi, Niloufar Bineshfar, Pooya Hosseini-Monfared, Shayan Amiri, Hamidreza Pazoki
Ian University of medical sciences

Introduction: Osteoarthritis (OA), a leading cause of disability worldwide, is characterized by articular cartilage degeneration, angiogenesis, subchondral bone sclerosis, and synovitis. Both cartilage and surrounding soft tissues may contribute to the pathogenesis of OA. Catabolic factors, including immune cells, proteases, and pro-inflammatory cytokines, have been detected in the synovium and are believed to play a pivotal role in cartilage degeneration through OA. Despite recent investigations, many gaps remain in understanding the biological mechanisms involved in the pathogenesis of OA. Colchicine, an alkaloid extracted from autumn crocus plants, is thought to possess anti-inflammatory/fibrotic activity with a well-documented therapeutic effect against gout. On the other hand, bortezomib is a proteasome inhibitor routinely employed to treat multiple myeloma.). The inhibition of nuclear factor-kappaB (NF-κB) and matrix metallopeptidase 13 (MMP13) secretion by colchicine and bortezomib can improve OA symptoms. OA is a highly debilitating disease with no known effective treatment; hence, there is a need to identify more effective treatments for OA. No prior study has investigated the simultaneous effect of colchicine and bortezomib in the treatment of OA. Given the significant role of NF-κB in the regulation of pro-inflammatory mediators in arthritis, we aimed to evaluate the anti-inflammatory effects of a two-drug combination (colchicine and bortezomib) through the inhibition of NF-κB.

Methos: OA was induced in thirty-six male Sprague-Dawley rats by anterior cruciate ligament transection with medial meniscus resection at eight weeks of age. Animals were randomly allocated to four equal treatment groups in the 12th week: 1) colchicine, 2) bortezomib, 3) a combination of colchicine and bortezomib, and 4) saline (control group) (Figure 2). The first group received 0.5 mg/ml intraarticular colchicine twice weekly for three consecutive weeks (6 injections). The second group received 0.25 mg/ml intraarticular bortezomib twice weekly for three consecutive weeks (6 injections). The third group received both medications intraarticularly. The control

Results: Compared to the control group, the bortezomib + colchicine combination group demonstrated superior outcomes in both OARSI ($p = 0.035$) and Mankin scores ($p = 0.005$). There was no significant difference in synovial membrane inflammation (Krenn) scores between groups ($p = 0.32$).

Discussion: Co-administration of colchicine and bortezomib may be a promising treatment method for OA that lowers the expression levels of MMP13 and NF-κB and reduces the resultant cartilage degradation. Similar to all studies, our experiment has some limitations. Our study was performed on an animal model of OA, and the effects of Bortezomib and Colchicine on OA in humans require further studies. Also, NF-kB and MMP-13 were chosen to evaluate in this study, but there are more contributor markers in OA pathology, and it is suggested that these pathways be evaluated more comprehensively. It is suggested that the pathology and relations between NF-kB and MMPs be evaluated comprehensively in more in vitro and in vivo models. However, our findings provide new insights for managing and treating OA in the future.

A-0746 EVALUATION OF THE RELIABILITY OF ARTHROSCOPIC DIAGNOSTIC SIGNS IN TRIANGULAR FIBROCARTILAGE COMPLEX ASSESSMENT

Hideo Hasegawa[1], Jean-Baptiste De Villeneuve Bargemon[2], Michel Levadoux[3]
[1]Orthopedic surgery, Nara Medical University, Nara, Japan; [2]Department of Hand Surgery and Limb Reconstructive Surgery, Timone Adult Hospital, Aix Marseille University, Marseille, France; [3]Hand, Wrist and Elbow Surgery, Saint Roch Private Hospital, Toulon, France

Introduction: Arthroscopic diagnosis of the triangular fibrocartilage complex (TFCC) lesions requires fine analysis of the lesion and good experience. Compared to the loss of trampoline sign and the hook test, the Floating TFCC sign is an evaluation method that does not probe TFCC directly. The aim of this study is to evaluate the interobserver and intraobserver reliability of the Floating sign.
Material & Methods: Twenty-one intraoperative videos were captured during the surgery of wrist arthroscopy. The senior author confirmed TFCC resilience on visual inspection and ballottement make the diagnosis. Three hand surgeons subsequently reviewed videos in a blinded fashion at 2 time points separated by 6 months.
Results: Agreement between observers for a positive trampoline test was 40 %, Hook test was 88 %, Floating TFCC sign was 63 %. The average percentage of intra-observer agreement regarding a positive trampoline test was 52 %, Hook test was 91 %, Floating TFCC sign was 58%
Conclusions: The Floating TFCC sign demonstrates moderate interobserver and intraobserver reliability compared to the loss of trampoline sign and the hook test. While the hook test showed the highest reliability, the Floating TFCC sign offers a non-invasive evaluation method that does not require direct probing of the TFCC.

A-0747 PATTERN OF LOOSENING AND HETEROTOPIC OSSIFICATION AFTER RADIAL HEAD ARTHROPLASTY IN TRAUMATIC ELBOW INJURIES

Claudia Lamas, Joan Juncosa, Marta Almenara, Aranzazu González-Osuna, Alvaro Toro, Manel Fa-Binefa
Hand Unit and Upper Extremity. Department of Orthopaedic Surgery. Hospital de la Santa Creu i Sant Pau. Universitat Autònoma de Barcelona. Sant Pau Biomedical Research Institute (IIB Sant Pau). Barcelona. Spain

Introduction: Implant loosening and heterotopic ossification of the elbow are complications with stiffness and high reintervention rates after a radial head prosthesis.
Aim: The aim of this study was to assess pattern of loosening and risk factors associated with heterotopic ossification of the elbow with radial head arthoplasty.
Material & Methods: A retrospective analysis was performed among 47 patients with unreconstruible radial head fractures treated with radial head arthroplasty from 2010 to 2016. Data included baseline patients characteristics, mechanism, presence and type of dislocation, associated fractures and collateral ligament injuries. Radiolucency lines, implant loosening and heterotopic ossification of the elbow was studied. Hasting-Graham functional classification was used. Data was analyzed using multivariate logistic regression model to evaluate associations between baseline characteristics and heterotopic ossification, implant loosenig, complications and reinterventions.
Results: Among 47 patients (mean age 52.6 years, 55% female), 83% developed heterotopic ossification. Mean follow up was 20 months (12-125 months). According to Mason-Johnson classification 30 were found to be type IV and 17 type III. Posterior elbow dislocation was present in 51% of the cases. Mean time to surgery was 6 days (0-24 days). Time to surgery was associated with an increase in heterotopic ossification size at 3 ($p=0.002$), 6 ($p=0.016$) and 12 months ($p=0.019$). Early elbow heterotopic ossification on the medial side was statistically significant at 3 months ($p< 0.001$)

and on the lateral side at 12 months (p= 0.004). High-energy trauma was present in 5 cases (10,64%). High-energy injuries was associated with increased ossification at 3 months. Subcapital area was the more frequent site showed for the presence of radiolucency lines and osteolysis (53,2%). A complication rate of 34% and a reintervention rate of 23.4% were found. Posterior elbow dislocation, time to surgery and high energy trauma were found to be significantly related to heterotopic ossification

Conclusions: Understanding lesions associated with a unreconstructible radial head prosthesis can help to know early implant loosening and heterotopic ossification of the elbow. This knowledge avoid poor functional results, complications and reintervention rates.

A-0748 DISTAL ULNAR NECK FRACTURE DISPLACEMENT WITH FOREARM ROTATION: A BIOMECHANICAL CADAVERIC STUDY

Camelia Tang[1], Amit Ramruttun[2], Siaw Meng Chou[3], Alphonsus Chong[2,4], Sreedharan Sechachalam[5]

[1]Singapore General Hospital, Singapore; [2]Yong Loo Lin School of Medicine, National University of Singapore, Singapore; [3]School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore; [4]National University Hospital, Singapore; [5]Tan Tock Seng Hospital, Singapore

Introduction: Management of distal ulnar fractures remains controversial, partly due to its low incidence and operative challenges encountered during surgical fixation.

Aim: This cadaveric study examined fracture displacement in isolated distal ulnar fractures, specifically AO Muller Q2 and Biyani Type I fracture pattern, during forearm pronosupination.

Material & Methods: 6 fresh frozen cadaveric upper limbs amputated at mid-humerus were used. Soft tissues including proximal and distal radioulnar joints were carefully preserved. Specimens were inspected grossly and radiographically for absence of pathologies. Radiocarpal and midcarpal pinning was performed to facilitate quantification of forearm rotation. 2 markers were each placed proximal and distal to fracture site to quantify fracture displacement. 3-dimensional positional data was recorded using an optoelectronic system (Vicon MX motion capture system).

Results: Distance between the 2 markers increased in the proximodistal and radioulnar axis, and decreased in the dorsovolar axis when the forearm was rotated from neutral to 100o pronation. The inverse was observed during supination. Mean aggregate fracture site displacement increased to 9.17 $\pm$ 2.78 mm at 100° pronation. Statistically significant increase in aggregate fracture site displacement was observed from 60° pronation onwards. At 100° supination, the aggregate fracture site displacement was 4.58 $\pm$ 8.62 mm. When supinating from neutral to 100°, fracture displacement did not increase significantly

Conclusions: Results from this study suggest that distal ulnar fractures are potentially unstable. Unrestricted forearm pronosupination with inadequate immobilisation might cause further fracture displacement. Further studies are required to assess distal ulnar fracture stability in vivo before treatment guidelines can be established.

A-0749 RECONSTRUCTION OF DISTAL RADIUS NON-UNION WITH FREE OSTEOCUTANEOUS FIBULA FLAP: A CASE REPORT

Maria Albuquerque[1], Luís Mata Ribeiro[1], Miguel Botton[2]
[1]Central Lisbon University Hospital, Lisbon, Portugal; [2]CUF Descobertas, Lisbon Portugal

Introduction: Distal radius fractures are the most common upper extremity fracture, representing 20% of all adult fractures. Non-union, though rare (0.2%), is associated with factors such as metaphyseal fractures, distal ulna fractures, and soft tissue compromise. Reconstruction of distal radius non-unions remains challenging, especially in complex cases involving poor vascularization and large bone defects. This report presents a successful reconstruction using a free osteocutaneous fibula flap in a patient with a 6 cm bone defect and failed prior treatments.
Aim: To demonstrate the efficacy of a free osteocutaneous fibula flap in managing distal radius non-union with significant bone and soft tissue compromise.
Material & Methods: A 43-year-old male with distal radius non-union following an open fracture underwent reconstruction after failed internal fixation and bone grafting. The procedure included debridement of necrotic bone, preparation of a 6 cm defect, and reconstruction using a vascularized fibula flap. End-to-end arterial and venous anastomoses were performed, and the radius was stabilized with a locking plate.
Results: Postoperative recovery showed no major complications, aside from transient skin paddle epidermolysis, which resolved with dressings. At six months, imaging confirmed complete bone consolidation, and the patient regained wrist and finger mobility with anatomical stability.
Conclusions: This case highlights the utility of a free osteocutaneous fibula flap for distal radius non-union, particularly in cases with soft tissue compromise or prior surgical failures. The technique facilitated functional recovery and structural stability, even in a defect smaller than the typical 6 cm threshold for fibula flaps. This approach underscores the importance of tailored, biologically active reconstruction for complex cases and suggests earlier consideration of vascularized flaps in similar scenarios.

A-0750 NEUROMOTOR REEDUCATION OF OVERUSE AND MISUSE SYNDROME IN CLASSICAL GUITARIST BY THERAPEUTIC PROPOSAL AND CUSTOM-MADE SPLINTS: CASE REPORT

Sabrina Centaro[1,2,3], Camilla Refice[1,4]
[1]Centro Mano Roma, Rome, Italy; [2]Sapienza University of Rome, Italy; [3]Executive board member of AIRM (Associazione Italiana Riabilitazione Mano) Italy; [4]Conservatory of Music 'Licinio Refice', Frosinone, Italy

Introduction: From the beginning of conservatory training, the instrumentalist is likely to develop playing - related musculoskeletal disorders (PMRDs) affecting the upper limb. Among the most frequently encountered PMRDs are the so-called “overuse” (overuse syndrome) or “misuse” (misuse syndrome) disorders. Based on the state of the art, we structured the therapeutic proposal dedicated to a classical guitarist suffering from overuse and misuse affecting the muscles of the right hand and forearm involved in the musical gesture. These pathologies were caused by the change of technique.
Aim: The aim of the instrument-specific reeducational program and custom-made splints was a return to the performing and teaching activities, through the treatment of typical overuse and misuse symptoms such as pain, incoordination and fatigability.
Material & Methods: The guitarist patient underwent the following rating scales: “Self-efficacy in the Study of Music” (ASM), strength (MRC), degree of upper limb function (QuickDASH) and pain (NRS), administered at the beginning, at

6 and 12 months of treatment. The reeducational strategy included recovery of neuromotor coordination of the fingers and the entire upper limb through therapeutic exercise and the resetting of correct guitar technique.
Results: The rating scales reported 60% progress in "Acquiring instrumental technique" and 40% progress in the item "Difficulty in using habitual technique to play his instrument; muscle strength increased by 60% and pain estimation went to zero.
Conclusions: The therapeutic proposal and the rationalized use of splints enabled the guitarist to restore neuromotor control of the right hand during musical gesture, thus allowing the resumption of professional activity as a teacher and performer.

A-0752 TREATMENT OF DISTAL RADIUS GIANT CELL TUMOR BY FREE FIBULA HEAD TRANSPLANTATION

Jiaxiang Gu,Hongjun Liu
Department of Hand- Foot Microsurgery, Subei People's Hospital affiliated to Yangzhou University , Yangzhou City, 225001, China.

Introduction: Giant cell tumor of bone is a benign primary bone tumor first described in 1818, characterized by multinucleated giant cells with a high recurrence rate and the possibility of malignant transformation . Compared with other aggressive tumors, giant cell tumor of bone does not show any obvious clinical or imaging features related to malignancy, and is an aggressive borderline tumor with a poor prognosis after malignant transformation . Giant cell tumor of bone usually occurs in the epiphysis and epiphysis of the long diaphysis of the limbs and extends to the articular cartilage. The results of surgical treatment for giant cell tumor of the distal ulna and radius are reported as follows:
Aim: To investigate the surgical effect of 2 cases of distal radius giant cell tumor treated by free fibula head transplantation.
Material & Methods: Two patients with distal radius giant cell tumor admitted to the Department of Orthopedics, Subei Hospital from January 2015 to December 2021 were male, aged 23 and 32. The pathological GTM classification was G1T1M0 in one case and G1T2M0 in another. Preoperative X-P showed that the huge giant cell tumor of the distal radius had invaded the extra-osseous soft tissue. The distal tumor tissue was removed at the lower part of the radiadian shaft, 3cm away from the tumor, and the proximal fibula graft carrying the lateral artery below the knee was performed for repair. The inferior ulnar and dorsal carpal ligaments were reconstructed intraoperatively. The preoperative Coony score of the wrist joint was 55 and 65, and the preoperative VAS score was 3.5 and 5.5. The long arm was removed after 6 weeks of postoperative plaster fixation and functional activity. healing time of free fibula bone,Coony score and VAS pain score of wrist joint were measured by postoperative follow-up
Results: The postoperative follow-up time was 24-36 months. 2 patients survived the free proximal fibula grafting , the mean bone healing time was 12 weeks, and the Coony score of wrist joint was 70 and 80.VAS score was 1.0 and 2.0. Postoperative X-P: lower radioulnar joint and radiocarpal joint were well matched .
Conclusions: Free fibula head transplantation is an effective treatment for giant cell tumor of bone of distal radius (pathological types G1T1M0, G1T2M0)

A-0753 ALGORITHM FOR MANAGEMENT OF FLEXOR TENDON INJURIES IN THE DIGITS

Hagay Orbach[1,2]
Guy Rubin[1,2]
[1]Emek medical center, Afula, Israel; [2]Faculty of medicine, Technion, Haifa, Israel

Introduction: Despite numerous clinical and bio-mechanical studies attempted to dictate a proper algorithm for surgical management of flexor tendon injuries in the digits, no gold standard has been determined for the optimal repair technique

and surgical decisions are usually made based on familiarity from training, popularity, and technical abilities.
Aim: We offer a new algorithm for flexor tendon repair combined with post-operative occupational therapy protocol for flexor tendon injuries in the digits.
Material & Methods: A retrospective review of all the patients' files who underwent flexor tendon repair in the digits, by a single surgeon, between October 2020 to October 2024. Based on our data, we built an algorithm of intra-operative decision making and post-operative protocol.
Results: Of 115 flexor tendon repairs reviewed, 10 patients had lost to follow up. Forty nine patients underwent flexor tendon repair using modified Kessler technique (2 strands) and epitenon continuous suture. Post-Operative therapy protocol was Duran (passive flexion active extension).Forty patients underwent flexor tendon repair using Modified Brunelii technique (2 strands) and epitenon continuous suture. Post-Operative therapy protocol was Very early active (active flexion and extension from day 1).Sixteen patients underwent flexor tendon repair using pullout technique (2 strands) only. Post-Operative therapy protocol was Very early active. Repair technique was chosen intra operatively according to the principal of moving the tension away from the injury site. Therefore, 2 questions should be asked. First, what is the distance between the tendon injury (not the skin laceration) and the finger mid pulp? Second, what is the quality of the edges of the tendons? Decision regarding the preferred surgical technique should be taken intra-operatively after answering these 2 questions.
Conclusions: Based on 2 questions, we built an algorithm that may be useful in choosing the preferred surgical technique for flexor tendon injury in the digits.

A-0755 RADIAL NERVE BIRTH INJURY – A SINGLE TERTIARY CENTRE 7.5 YEAR EXPERIENCE & REVIEW OF THE LITERATURE

Lucy E Homer Newton, Eric Dos Santos, Alison Tidswell, Chris Sneade, Pundrique Sharma
Alder Hey Children's NHS Foundation Trust

Background: The true incidence of radial nerve birth injury is unknown due to the overlap with the presentation of obstetric brachial plexus injury. Radial nerve birth injury may also present with discrete clinical signs such as a palpable nodule or ecchymosis over the posteriolateral arm. These patients have a good prognosis and tend to recover without the need for surgical intervention.
Aims: To characterise the number of patients presenting to the paediatric brachial plexus service at a tertiary referral centre as well as their presentation and recovery trajectory. A literature review was also completed to assess the global experience in managing these patients and their outcomes.
Methods: A retrospective single centre review of all patients with radial nerve birth injury between 2016 and 2024. Patients were identified from clinical coding as well as from clinic attendance. A literature review was conducted not limited by time or language.
Results: Thirteen patients were identified with radial nerve birth injury with 14 affected limbs. Six (43%) affected limbs were right sided; eight (61.5%) were female. Median age at diagnosis by the specialist centre was 60 days (range 1-185 days). Four (29%) limbs had ecchymosis on the arm and five (36%) had a palpable nodule. Median time to recovery, as determined by a health care professional at the tertiary centre, was 162 days (90-824 days). All patients were offered physiotherapy; no child required surgery. A further 98 cases were identified from the global literature and only one patient required surgery, making an incomplete recovery.
Conclusion: It is important to consider isolated radial nerve injuries when referring and assessing a child for obstetric brachial plexus injuries, particularly in the presence of ecchymosis or a palpable nodule on the posterolateral arm. Radial

nerve birth injury has a good recovery trajectory by 6 months of age with physiotherapy alone. It is useful to ensure that all patients are assessed using a common evaluative tool, such as the Active Movement Scale, to ensure comparison between global work.

A-0756 RESTORATION OF GENUINE SENSATION AND PROPRIOCEPTION OF INDIVIDUAL FINGERS FOLLOWING HAND AMPUTATION WITH TARGETED SENSORY REINNERVATION AS A MECHANONEURAL INTERFACE

Alexander Gardetto[1,3], Jacques H. Hacquebord[2], Omri Ayalon[2], Franco Bassetto[3], Michele Colonna[4], Diane Atkins[5], Jennifer Ernst[6]

[1]Brixsana Private Clinic, Bressanone, Italy; [2]New York University Grossman School of Medicine, USA; [3]Padova University Hospital, Italy; [4]Messina University Hospital, Italy; [5]Baylor College of Medicine, Houston, USA; [6]Hannover Medical School, Germany

Introduction: Tactile gnosis results from the interaction between the hand's tactile inputs and the brain's memory systems. It is essential for complex hand functions, and sensory impairment can cause severe disabilities. Previous invasive and non-invasive sensory substitution methods for prosthetic feedback have failed in clinical applications because they do not replicate the natural sensation of the somatosensory cortex.

Aim: To present a novel surgical technique, upper limb targeted sensory reinnervation (uITSR), and demonstrate how single digital nerves can selectively reinnervate the forearm skin, restoring the spatial sensory capacity of individual digits in amputated hands, as well as addressing the treatment and prevention of phantom limb pain and neuroma pain.

Material & Methods: Herein, we describe a novel surgical technique for upper limb targeted sensory reinnervation (uITSR) and report how single digital nerves selectively reinnervate the forearm skin and restore the spatial sensory capacity of single digits of the amputated hand in a case series of ten patients. We explore the interplay of the redirected residual digital nerves and the interpretation of sensory perception after reinnervation of the forearm skin in the somatosensory cortex by evaluating sensory nerve action potentials (SNAPs), somatosensory evoked potentials (SEPs) and amputation-associated pain qualities.

Results: Digital nerves were rerouted and reliably reinnervated the forearm skin after hand amputation, leading to somatotopy and limb maps of the thumb and four individual fingers. SNAPs were obtained from the donor digital nerves after stimulating the recipient sensory nerves of the forearm. Matching SEPs were obtained after electrocutaneous stimulation of the reinnervated skin areas of the forearm where the thumb, index and little fingers are perceived. Pain incidence was significantly reduced or even fully resolved.

Conclusions: We propose that uITSR can lead to higher acceptance of prosthetic hands and substantially reduce the incidence of phantom limb and neuroma pain. In addition, the spatial restoration of lost-hand sensing and the somatotopic reinnervation of the forearm skin may serve as a machine interface, allowing for genuine sensation and embodiment of the prosthetic hand without the need for complex neural coding adjustments.

A-0757 APPLICATION OF HA3D TECHNOLOGY FOR THE TREATMENT OF FOREARM DEFORMITIES ON A COMPLEX CASE, OUR EXPERIENCE

Giulia Pachera, Vittoria Mazzola, Federico Vitali, Alessandra Galuppi, Emanuela Dapelo, Giacomo Demontis, Stefania Briano
Policlinico San Martino, Genova, Italia

Introduction: The management of forearm nonunion is challenging for orthopaedic surgeons because the forearm is a unique anatomical segment in which all the bones and structures involved embody a complex functional unit. Therefore,

when treating such a complex condition, the surgeon must focus not only on bone healing but also on the restoration of the native anatomy in order to replicate the normal relationship between the bones and all the surrounding structures and thus the full function of the forearm, the elbow and the wrist.
Aim: The aim of this paper is to present a complex case of ulnar diaphyseal bone defect as the outcome of an aseptic nonunion associated with a radial diaphyseal malunion, treated with the Masquelet technique and a corrective osteotomy performed with the aid of 3D technology.
Material & Methods: After 14 years from surgery, the patient went to our hospital with a left forearm deformity. He had a clinically evident angular and rotational deformity of the forearm, limiting the full extension of the elbow and the pronation-supination of the forearm. X-rays highlighted an atrophic nonunion of the proximal diaphyseal ulna fracture and a malunion of the radius. We performed as a first step the removal of the implants and intra-operative samples were collected from both bones for microbiology to exclude infections. The objectives to be achieved were therefore the correction of the three-dimensional deformity of the radius and the consolidation of the ulna to recover the function of the forearm. The intention was to use the Medics 3D Diagnostic Devices that provide the surgeon with the possibility of interacting with the anatomy to simulate the reduction of the fracture fragments, study and plan the radius osteotomy with the use of a guide template. The second surgical step was therefore to perform a radius osteotomy with triplanar correction and osteosynthesis with a compression plate, on the ulnar side it was decided to perform the Masquelet technique. Subsequently, as a third and final step, the cement was removed while maintaining the biological chamber, and osteosynthesis was performed with a plate and homologous bone graft harvested from the iliac crest.
Results: The patient underwent serial check-ups at 1-3-6 months and at one year. The radiographic control showed consolidation of the radius and ulna, a correct alignment of the DRUJ and PRUJ joints, clinically a complete ROM with almost complete pronation and supination and recovery of strength and functionality.
Conclusions: The use of Hyper Accuracy 3D was helpful in studying and preparing the surgical program. We were able to study and simulate the surgery and the correction of the radius malunion and then subsequently evaluate how to treat the bone gap of the ulna nonunion. In addition to the surgical program, the possibility of having cutting guides available allowed us to perform the radius osteotomy safely and in a short time.

A-0758 FREE TISSUE TRANSFER FOR NECROTISING SOFT TISSUE INFECTIONS OF THE UPPER LIMB: A CASE SERIES

Olivia Hartrick[1], Cara Bennett[1], Rebecca Shirley[1], James Chan[1,2]
[1]Stoke Mandeville Hospital, Aylesbury, UK; [2]University of Oxford, Oxford, UK

Introduction: Necrotising soft-tissue infections (NSTI) of the upper limb are life- and limb-threatening conditions that require extensive reconstruction. Free tissue transfer (FTT) for NSTI reconstruction as well as the resultant function and QOL have rarely been reported.
Aim: This study reports the outcomes of patients who have undergone FTT for NSTI.
Material & Methods: A retrospective single-centre study. Inclusion criteria: adults undergoing FTT for NSTI of the upper limb from 2022-2024. Data collected included patient demographics, injury specifics, number of operative interventions, QuickDASH and WHOQOL-BREF scores.
Results: Four patients underwent six FTT procedures. Microbiology: Group A Strep pyogenes x3, Staph aureus x1.
Patient; Age; Sex; Risk factors and BMI; Injury site (%TBSA); Critical structures exposed; Flap; QuickDASH
1 47; F; BMI=23; Circumferential forearm/hand 7%; Median nerve tendons; Simultaneous ALT'sx2; 75.
2 49; F; T2DM, HTN BMI=39; Forearm/hand 2%; Tendons, open wrist joint; MSAP; 16.

3 28; M; BMI=26.5; Forearm 2%; Tendons; ALT; 36.
4 52; F; PVD BMI=40.5; Palm/wrist <1%; Median nerve tendons; MPA flap – failed 2nd MPA flap; 55.
Mortality: 0; mean hospital stay: 22.5 days; mean time from admission to FTT: 23 days; median number of surgical debridements: 2.5.
Flap loss: total (n=1)/partial (n=1); flap exploration (n=3); mean QuickDASH score of 45 (16-75). WHOQOL-BREF scores: Physical 51.75, Psychological 56.25, Social 54.75 and Environmental 68.75. Secondary procedures included tenolysis, arthrodesis, webspace release and liposuction and debulking.
Conclusions: NSTI in the upper limb is a devastating condition that, despite FTT, is associated with poor function and QOL. Defects are heterogeneous. High BMI was common and may be associated with risks of failure and return to theatre.

A-0759 CORRELATION BETWEEN SCREW LENGTH AND TIME TO RADIOGRAPHIC UNION IN INTRAMEDULLARY HEADLESS SCREW FIXATION FOR DIAPHYSEAL METACARPAL FRACTURES

Bert Vanmierlo[1], Pieter Van Geel[2], Arne Decramer[1], Kira Vande Voorde[1], Joris Duerinckx[3]
[1]AZ Delta Roeselare, BE; [2]AZ Sint-Blasius Dendermonde, BE; [3]ZOL Genk, BE

Introduction: Intramedullary headless screw (IMHS) fixation offers rigid stability and early functional recovery for diaphyseal metacarpal fractures. While screw diameter relative to the medullary canal has been studied extensively, the effect of screw length on fracture consolidation remains underexplored.
Aim: This study investigates the potential correlation between screw length and time to radiographic union in patients undergoing IMHS fixation.
Material & Methods: We conducted a retrospective analysis of patients treated with IMHS fixation for extra-articular, unstable diaphyseal metacarpal fractures between June 2020 and June 2024. Inclusion criteria encompassed fractures of the index, middle, ring, and little fingers. Exclusion criteria included minors, intra-articular fractures, thumb fractures, fractures exceeding twice the metacarpal diameter, associated soft-tissue injuries, delays beyond two weeks post-trauma for surgery, and prior metacarpal fractures. Postoperative care included a custom orthosis and immediate mobilization. Follow-up continued until radiographic union was confirmed. Data on screw type, length, diameter, and insertion direction were collected. Correlation analyses were performed using Spearman's Rank Correlation Coefficient.
Results: Twenty patients (mean age: 37 years; 6 females, 16 males) met the inclusion criteria. Screw insertion was performed antegrade in six patients and retrograde in fourteen. Treated fractures included four index, three middle, seven ring, and six little fingers. Screw lengths ranged from 30-42 mm (mean: 38.3 mm; SD: ±4.07). Radiographic consolidation was achieved in all cases, with an average time to union of 48.55 days (range: 23-109 days; SD: ±21.16). One complication occurred, involving screw protrusion due to secondary fracture impaction, necessitating screw removal. Correlation analysis revealed a significant association between longer screw lengths (42 mm) and extended consolidation times ($p<0.05$).
Conclusions: The study demonstrates a significant correlation between screw length and time to radiographic consolidation in diaphyseal metacarpal fractures treated with IMHS fixation. Specifically, longer screws were associated with extended times to consolidation. This may be due to increased construct rigidity, which minimizes micromotion necessary for rapid secondary bone healing. In contrast, shorter screws appear to facilitate faster healing through enhanced micromotion and subsequent callus formation. These findings suggest that selecting an optimal screw length—balancing stability with controlled micromotion—could improve healing times. IMHS fixation remains a reliable method with high rates of union and minimal complications. Further research is necessary to validate these results and guide clinical decision-making for screw length selection.

A-0760 COLLAGENASE CLOSTRIDIUM HISTOLYTICUM VERSUS NEEDLE FASCIOTOMY FOR PRIMARY METACARPOPHALANGEAL DUPUYTREN CONTRACTURE. FIVE-YEAR RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

Ingi Thor Hauksson, Morten Beier Havdal, Jurate S Benth, Sigurd E. Hoelsbrekken, Per-Henrik Randsborg
[1]*Akershus University Hospital, Lørenskog, Norway;* [2]*Campus Ahus, Oslo University Hospital, Norway*

Introduction: Collagenase Clostridium histolyticum (CCH) and percutaneous needle fasciotomy (PNF) are 2 treatment options for Dupuytren disease

Aim: The purpose of this study was to compare these 2 methods in terms of clinical and patient-reported outcomes

Material & Methods: Eighty patients (median age,72 years ; 83%male)with a single-digit primary metacarpophalangeal (MCP) joint contracture of 30°or more were randomized to either CCH or PNF and followed for 5 years. The primary outcome was the difference in flexion-contracture reduction at the MCP joint from baseline to 2 years, with additional analysis examining the effect of the primary endpoint variable up to 5 years. Secondary outcomes included complications, grip strength, scores on the visual analogue scale (VAS) for pain, the shortened version of the Disabilities of the Arm, Shoulder and Hand, the brief Michigan Hand Questionnaire, Unite 'Rhumatologique des Affections de la Main, and a VAS for treatment satisfaction as well as recurrence and retreatments

Results: The mean MCP joint contracture was 48°at baseline and 2° at 5 years in the CCH group and 50° at baseline and 7° at 5 years in the PNF group. The reduction in MCP contracture at 2 years was larger in the CCH group than in the PNF group, with a mean difference between the groups of 12° (95% confidence interval [CI], 1.5° to 22.3°; $p = 0.026$). At 5 years, this mean difference was reduced to 6° (21.5° to 12.8°; $p = 0.1$). There was no difference between the groups in any patient-reported outcome scores or grip strength beyond 4 weeks, with the exception of the brief Michigan Hand Questionnaire at 5 years. Ten (25%) of the patients in the PNF group compared with no patient in the CCH group had recurrence (contracture of 30° or more) at the MCP joint at 2 years. At 5 years, 17 (42.5%) of 40 patients in the PNF group had been retreated compared with 4 (10%) of 40 in the CCH group ($p < 0.001$). The CCH group experienced more transient complications (stiffness and hematoma) during the first week and were more satisfied (VAS satisfaction) from 1 year to the 5-year follow-up

Conclusions: The main finding of this study is that CCH and PNF were equally effective in reducing MCP flexion con- tracture, but the correction of contracture lasted longer in the CCH group.

A-0761 EARLY COMPLICATIONS PREDICTIVE FACTORS ASSOCIATED WITH PATIENTS' CHARACTERISTICS IN WALANT UPPER LIMB SURGERY

Joana Contente[1], João Diogo Silva[1], Érica Marto[1], Alexei Buruian[1], Daniela Pereira[1], Lisete Mónico[2], Carlos Ramos De Pina[1]
[1]*Orthopedics 2 Department, Centro Hospitalar de Leiria, Portugal;* [2]*Universidade de Coimbra, Center for Research in Neuropsychology and Cognitive and Behavioral Intervention (CINEICC)*

Introduction: With the increasing use of Wide-Awake Local Anesthesia No Tourniquet (WALANT) as a growing anesthetic option for simple Upper Limb surgery (ULS) and the lack of literature on early complication predictive factors, the purpose of this study was to analyse patient-related predictive factors for early complications in WALANT ULS across a wide range of procedures.

Aim: Analyse patient-related predictive factors for early complications in WALANT ULS across a wide range of procedures.

Material & Methods: We retrospectively reviewed all patients undergoing WALANT ULS in outpatient setting, between 2017 and 2022, with at least 30 days follow-up. Demographic and medical information, postoperative complications and follow-up of 1064 patients eligible for inclusion were collected from institutional records. Trauma and elective procedures were performed.

Results: We identify an overall complication rate of 9.1%, with a peri-operative and early postoperative complication rates of 2.3% and 7.1%, respectively. The most frequent early complications were pain (3.0%) and superficial infection (2.3%). 5.0% of patients had an unexpected hospitalization and 6.0% needed reintervention. Numbers in accordance with the latest literature results. Male sex was associated with overall postoperative complication rate, suture dehiscence, ischemic and WALANT associated complications. No correlations were found between patients' age and complications. When analysing the influence of each medical comorbidity we found that smoking was a positive predictive factor for surgical pain and anesthetic conversion, unexpected hospitalization and reintervention and WALANT associated complications; Alcoholism was a positive predictive factor for surgical technique complications and unexpected reintervention; Autoimmune diseases or recent or chronic administration of immunosuppressants was a positive predictive factor for anesthetic conversion; and Dyslipidemia was a predictive factor for overall postoperative complications. Logistic regression analyses using medical antecedents as predictors and each complication separately as criterion variables did not result in a model with significant sensitivity to predict any complication.
Conclusions: In conclusion, male sex, smoking, alcoholism, autoimmune diseases or recent or chronic administration of immunosuppressants and dyslipidemia were significant predictive factors for early complications. Only male sex and smoking seem to be possible risk factors for WALANT complications. Further research with prospective designs is expected to validate these findings and to identify effective changes to mitigate the impact of risk factors on patients' surgical outcomes.

A-0762 AMYLOIDOSIS SCREENING AT CARPAL TUNNEL AND TRIGGER FINGER RELEASE SURGERY, EARLY RESULTS

Emanuele Gerace[1], Emanuele Pamelin[2], Alessandro Arbau[3], Erika Maria Viola[4], Lorenzo Rocchi[1]
[1]Hand Unit, Fondazione Policlinico Gemelli IRCCS; Rome, Italy; [2]Hand Unit, Clinica San Martino, Lecco, Italy; [3]Orthopedics Unit, AOU Sassari, Italy; [4]Orthopedics Unit, Ospedale Maggiore di Cremona, Italy

Introduction: Amyloidosis is a disorder where pathologically misfolded endogenous precursor proteins aggregate extracellularly. Cardiac involvement can lead to heart failure. Transthyretin (TTR) deposits is associated with carpal tunnel and trigger finger. Their symptoms can anticipate cardiomyopathy. Early diagnosis of amyloidosis TTR (ATTR) can improve patient's quality of life and life expectancy.
Aim: The aim of this study is to screen patients with a recent story of CTS or trigger finger using the most supported red flags in literature, assessing their specificity and sensitivity.
Material & Methods: We describe the early results of a double-center prospective observational study. Red flags for ATTR are concomitant carpal tunnel syndrome (CTS) and trigger finger, bilateral CTS, recurrent CTS, multiple trigger finger, known cardiomyopathy. Exclusion criteria of the study are: recent trauma, rheumatologic disorders.
Tissue confirmation of amyloidosis is performed at the time of CTS or trigger finger surgery with biopsy of the tenosynovium or of the transverse carpal ligament. Positive patients are routed to a multidisciplinary diagnostic-therapeutic pathway.
Results: We included a total of 58 patients. 36 patients underwent carpal tunnel release (CTR) and 22 patients with trigger finger. Mean age was 64 years old, 52% were male. A positive ATTR specimen was found in 21% of cases. 12 patients who underwent CTR were affected by bilateral CTS and 41% of them resulted in a positive ATTR biopsy. 33% of patients with bilateral CTS and multiple trigger fingers were found with a positive sample. 25% of the patients found with a positive sample were affected by multiple trigger finger. Only 10% of patients with already known cardiomyopathy but without any other hand affection (CTS, trigger finger) other than the elective surgery, have shown positivity for amyloidosis
Conclusions: In literature almost 50% of patients with ATTR have a history of CTS. Bilateral manifestation is the most common association with amyloidosis and it is characterized by a high rate of CTS recurrence. On average, it precedes the

cardiac involvement by five to ten years. Correlation of trigger finger with ATTR is well described in literature, although it is based on limited series.
Identifying the red flags for ARRT the hand surgeon can play an active role in early diagnosis and quick onset of disease modifying therapy. Given the safe and cost effective profile of the biopsy, in our opinion tissue specimen collection at the time of routine hand surgery procedures should be routinely considered for selected patients.

A-0764 SOFT TISSUE RECONSTRUCTION IN ORTHOPEDICS: A RETROSPECTIVE REVIEW OF FOUR YEARS IN A HIGH-VOLUME CENTER

Pedro Teixeira Mota, César Silva, João Rosa, Alexandre Pereira
Hospital de Santo António, Porto, Portugal

Introduction: Soft tissue complications are a significant challenge in orthopedic surgery, often becoming the primary concern in complex cases. Managing these issues is especially critical in high-volume orthopedic departments, such as ours, which performs over 10,000 procedures annually. These complications are particularly prevalent in tumoral surgeries, arthroplasty revisions, and traumatic cases. In our institution, the hand unit has assumed responsibility for addressing these challenging soft tissue defects.
Aim: This study aims to underscore the importance of incorporating soft tissue coverage surgeries into the repertoire of an orthopedic department, emphasizing their role in optimizing patient outcomes.
Material & Methods: A retrospective analysis was conducted of patients who underwent soft tissue coverage surgeries in our department over the past four years. Surgical techniques, indications, and outcomes were reviewed and analyzed.
Results: Over the four-year period, 36 soft tissue coverage surgeries were performed, all by orthopedic surgeons within the hand unit. The procedures included:
Split-thickness skin grafts: 8 cases (all traumatic wounds, healed uneventfully).
Flaps: Gastrocnemius muscle flaps: 10 (primarily for prosthetic knee infections; one tumor-related case; all survived, though 2 required reoperation for infection recurrence).
Radial forearm flaps: 3 (used for dorsal hand and elbow defects).
ural flaps: 3 (for ankle defects; 1 total flap loss treated with negative-pressure wound therapy and subsequent skin grafting).
Peroneus brevis muscle flaps: 2 (for lateral malleolus exposure after internal fixation).
Fasciocutaneous rotation flaps: 2 (to cover olecranon defects—1 post-plate retention and 1 post-plate removal).
Fasciocutaneous bipedicled flap: 1 (for a lateral ankle wound).
Tensor fascia lata flap: 1 (for a trochanteric ulcer).
Latissimus dorsi flaps: 3 (2 free flaps for distal leg defects, with 1 total flap loss leading to amputation).
Free vascularized fibular flaps: 3 (for segmental femoral defects following tumor resection or infection).
Outcomes indicated high success rates across most procedures, with complications including 1 complete flap loss (sural flap) and 1 free flap failure (latissimus dorsi), resulting in amputation.
Conclusions: The concept of orthoplastics—integrating soft tissue and bony reconstructions—is gaining recognition in the literature and reflects a shift in orthopedic training and practice. While traditionally focused on bone-related procedures, orthopedic surgeons, particularly those in hand surgery, are increasingly addressing soft tissue challenges. This study highlights the importance of equipping orthopedic departments with the skills and expertise to manage a broad spectrum of soft tissue defects, ultimately improving patient care and outcomes.

A-0766 TREATING DIGITAL CRUSH NEUROMAS IN THE PULP WITH CENTRO-CENTRAL NERVE TRANSFER: THE U-TURN METHOD

Mojahed (Mooji) Sakhnini
meuhedet health services, Israel

Introduction: Still, neuromas are difficult to treat although a lot of surgical techniques are described in detail. We revive the centro-central nerve transfer as a method for treating neuromas causes by crush injuries to the pulp of digits.
Aim: To assess the outcome of treating painful neuromas of crushed pulp of digits with centro-central nerve transfer and descrube the surgical technique and offer a new approach to this specific injury.
Material & Methods: 5 patients who have crush injury in their digits with local pianful neuroma were treated with proximal digital nerve transection of their corresponding digital nerves and suturing of both proximal stumps to each other for every digit involved.
Results: For all patients, pain was resolved completely in the pulp of the digits. full grip was achieved with symmetric power.
Conclusions: Sacrificing non-critical sensation in injured digits could resolve pain generated by local neuroma in crushed pulp.The U-turn method is a potent surgical technique to treat neuromas caused by crush injury to the pulp.

A-0767 EFFECTIVENESS AND COSTS OF EXERCISE THERAPY IN PATIENTS WITH THUMB CARPOMETACARPAL OSTEOARTHRITIS: A MULTICENTER, RANDOMIZED CONTROLLED TRIAL

Robbert M Wouters[1,2], Lisa MJ Esteban Lopez[1,2,3], Stella CM Heemskerk[5], Sita MA Bierma-Zeinstra[6,7], Gerald A Kraan[8], Joost Colaris[7], J Michiel Zuidam[1], Guus M Vermeulen[4], the THETA Study Group Collaborators, Ruud W Selles[1,2]
[1]Department of Plastic, Reconstructive, and Hand Surgery, Erasmus MC, University Medical Center Rotterdam, The Netherlands; [2]Department of Rehabilitation Medicine, Erasmus MC, University Medical Center Rotterdam, The Netherlands; [3]Center for Hand Therapy, Xpert Hand Therapy, Flight Forum 130, 5657 DD, Eindhoven, The Netherlands; [4]Hand and Wrist Center, Xpert Clinics, Eindhoven, the Netherlands; [5]Department of Public Health, Erasmus MC, University Medical Center Rotterdam, The Netherlands; [6]Department of General Practice, Erasmus MC, University Medical Center Rotterdam, The Netherlands [7]Department of Orthopaedics and Sports Medicine, Erasmus MC, University Medical Center Rotterdam, Rotterdam, The Netherlands; [8]Department of Orthopaedics, Reinier de Graaf Hospital and Reinier Haga Orthopaedic Center, Delft, The Netherlands

Introduction: Current guidelines and reviews advise nonsurgical treatment, including exercise therapy and orthoses, before considering surgery in patients with thumb carpometacarpal (CMC-1) osteoarthritis (OA). However, although widely used, strong evidence supporting exercise therapy is lacking, and it is unknown if additional exercise therapy compared to an orthosis alone reduces the conversion to surgery rate. Furthermore, the costs of these treatments are unknown.
Aim: To compare the effectiveness of an orthosis + exercise therapy with only an orthosis on pain at 3 months and conversion to surgery <1 year in patients with CMC-1 OA. Secondary outcomes were costs, health-related quality of life, hand function/activities of daily living, satisfaction with treatment results, return to work, grip and pinch strength, range of motion, patient-reported experience measurements (PREMs), and psychological factors.
Material & Methods: Multicenter (n=18 centers), single-blinded, randomized controlled trial. The primary outcomes were pain at 3 months (measured with the Michigan Hand Outcomes Questionnaire pain subscale) and conversion to surgery within 1 year. Adult patients were eligible if they had CMC-1 OA Eaton stage ≥2 and could visit the treatment center. Exclusion criteria were secondary CMC-1 OA (e.g., due to Bennett's fracture), history of interventions or comorbidity interfering with treatment/outcome, and insufficient understanding of the Dutch/English language. The treatments comprised a combination of an orthosis + exercise therapy (including weekly therapy sessions and home exercises) compared to only an orthosis.

Results: We included 166 patients; 81 were in the orthosis + exercise group and 85 in the orthosis-only group. Both the orthosis + exercise group (from 51.3 [46.9 to 55.6] to 65.4 [60.5 to 70.3]) and the orthosis-only group (from 50.8 [46.8 to 54.8] to 61.9 [57.4 to 66.5]) improved on pain at 3 months ($p<0.001$), but there was no between-group difference ($p=0.309$). The conversion to surgery was 4.9% (n=4) in the orthosis + exercise group and 9.4% (n=8) in the orthosis-only group. This difference was not statistically significant ($p=0.416$) due to the low conversion to surgery rates. The total societal costs for orthosis + exercise were €827 (36.7%) lower per patient than orthosis-only. The orthosis + exercise group reported better satisfaction with treatment results at 3 months (77.1% versus 53.5% at least somewhat satisfied, respectively, $p=0.004$) and activity performance at 6 weeks and 3 months ($p=0.005$-0.011). There were no differences in the other secondary outcomes

Conclusions: Both an orthosis + exercise therapy and an orthosis alone provided clinically relevant pain relief and low conversion to surgery, but there were no significant between-group differences (although this was due to insufficient statistical power for conversion to surgery). The orthosis + exercise therapy provided better satisfaction with treatment results, PREMs, and a €827 cost reduction per patient. Therefore, an orthosis + exercise therapy is preferred over orthosis-only in patients with CMC-1 OA.

A-0769 SCHWANNOMA EVERYWHERE: A DIFFERENT CASE OF MULTIPLE SCHWANNOMA

Carolina Correia, Pedro Falcão, André Chambel
CUF, Lisboa, Portugal

Introduction: Schwannomas are the most common benign tumors of the peripheral nerve sheath and despite their rarity, comprise 5% of all soft-tissue tumors originates. Simultaneous diagnostic of ipsilateral schwannomas of the median nerve and posterior interosseous nerve is an even rarer entity.

Material & Methods: The authors present the case 40 year old male with relevant personal history of acoustic schwannoma presented with a 10-year history of two palpable masses in the right forearm, which became painful in the last months before orthopedic evaluation. The diagnosis of neurofibromatosis was excluded at the time of acoustic schwannoma surgery . Upon physical examination, palpable masses measuring approximately 2 centimeters each were found on the volar aspect of the wrist and on the dorsal aspect of the forearm, and a positive Tinel sign, with no other significant changes on physical examination. The patient underwent MRI study, which showed 5 neural sheath tumors on the posterior interosseous, median and ulnar nerves.

Results: The patient underwent excision of two painful masses that affected the median nerve and the posterior interosseous nerve, using microsurgical technique by volar and dorsal approach. It was sent for anatomopathological study, which confirmed the diagnosis of schwannoma. Postoperative period was uneventful, with a decrease in pain complaints and no neurological deficits

Conclusions: Although schwannoma is one of the most common tumors of the peripheral nerve sheath, it is only present in approximately 5% of cases, with the head and neck being its preferred location. When it affects the upper limb, it tends to affect the volar face due to the greater concentration of nerve fibers, with the median and ulnar nerves being the most affected. Thus, the rarity of the case presented is verified by the concomitant presence of multiple schwannomas in less frequent locations. A thorough search of the literature revealed a low incidence of these injuries affecting the posterior interosseous nerve and no references to simultaneous injuries were found.

A-0770 ASSESSING SCAFFOLD-GUIDED BONE REGENERATION USING A 3D PRINTED POLYCAPROLACTONE-TRICALCIUM PHOSPHATE (PCL-TCP) COMPOSITE SCAFFOLD IN A RODENT MODEL

Abby Choke, Heng Shu Yun, Lim Yu Jing, Duncan Angus McGrouther, Andrew Chin
Department of Hand and Reconstructive Microsurgery, Singapore General Hospital

Introduction: Scaffold-guided bone regeneration is a technique that utilizes 3D printing technology to create a composite scaffold that is accurate in dimension of the bone defect, biocompatible for clinical use, and serves as a template for cell proliferation and ingrowth of new tissue. The new generation of 3D scaffold comprising of Polycaprolactone-Tricalcium Phosphate (PCL-TCP) had been translated for clinical utility in large bone defect of the cranium and lower limb with success. However, there is still a paucity of clinical studies for the use in upper limb defects.
Aim: We aim to develop a more robust understanding in the basic sciences of tissue regeneration in a scaffold guided construct in a rodent model for translation to small bones in hand surgery. We hypothesise that 3D scaffold-guided bone regeneration is superior in bone regeneration when compared to native bone regeneration without autologous bone graft.
Material & Methods: A total of 12 live Wistar rats were divided into two groups for this case control experiment. The right femur of each rat is exposed and a 3mm critical size defect is made at the mid shaft of the femur using an electric burr. A 1.3mm 4-hole locking plate was used for rigid fixation of the fracture. In Group 1, the defect was created and left alone to allow for native bone regeneration. In Group 2, the PCL-TCP 3D scaffold was placed as an intervening bone graft at the defect site. The rats were monitored with adequate provision of analgesia and antibiotics in the post operative phase. At 12 weeks, the rats were sacrificed for radiological and histological analysis.
Results: At 12 weeks, 5 out of 6 rats in Group 1 showed complete bone healing with mature callus at the defect site. In Group 2, 3 out of 6 rats showed superior integration of bone forming cells into the scaffold with bridging callus across the defect, 2 out of 6 rats showed incomplete bridging across the scaffold.. There were 2 cases of implant failure with one in each group.
Conclusion: 3D printed scaffold showed superior bone regeneration for critical sized defect of the long bone in a rodent model. The additional advantage includes the bioresorbable property, the provision of osteoconductive structural support for early weight bearing, while obviating the morbidity of autologous grafting. This can be a promising alternative for large bone defect in hand surgery.

A-0771 ROUTINE USE OF DUAL MOBILITY PROSTHESIS REDUCES TRAPEZIOMETACARPAL JOINT DISLOCATIONS

Nastaran Sargazi, Thomas Cash, Sarah Dyson, Adrianna Sherburn, Graham Cheung
Liverpool University Hospitals NHS Foundation Trust, Liverpool, United Kingdom

Introduction: Trapeziometacarpal joint arthroplasty (TMA) is associated with shorter recovery and increased grip strength, thereby gaining popularity. Instability rates as high as 13% have been reported, hence the introduction of the dual mobility (DM) prosthesis.
Aim: We aim to compare dislocation rates with the use of the single mobility (SM) versus DM MAIA implants.
Materials and Methods: A retrospective review of all patients undergoing TMA at our tertiary hand unit was conducted between January 2016 and October 2024. Data was collected regarding patient demographics and implant type, with the primary outcome analysed being dislocation rates between the two prosthesis. Secondary outcomes included conversion to trapeziectomy (CTT) and overall surgical complications.
Results: 108 MAIA prosthesis were implanted in 81 patients. This included 63 females and 18 males, with an average age

of 62 years (range 41-79). 63 patients underwent SM TMA and 41 received DM TMA. Dislocations occurred in 6.3% of SM group, with no dislocations in the DM group (p=0.154). CTT was undertaken in 7.9% of SM implants for unexplained pain (3.1%), aseptic loosening (3.1%) and dislocation (1.6%), in comparison to 4.9% in the DM group, which were all undertaken for aseptic cup loosening. Implant revision rate was 3.1% and 0% of SM and DM groups respectively (p=0.5177). The overall surgical complication rate was 12.7% in SM group, which included 1(1.6%) intra-operative fracture, 4(6.3%) implant instability, 2(3.2%) aseptic cup loosening and 1(1.6%) with unexplained pain. 17.1% of DM patients had complications which included 2(4.8%) intra-operative fractures, 2(4.8%) aseptic cup loosening, 1(2.4%) tendon attrition and 1(2.4%) with ongoing stiffness.
Conclusions: Routine use of the dual mobility MAIA implant was associated with a significant reduction in implant dislocation and lower re-operation rates. A slightly higher overall complication rate was noted in the DM group, which may in part be explained by the broadening of indications for surgery during the study period.

A-0772 WHAT IS THE MAIN CRITERION WHEN CHOOSING THERAPY FOR CMC 1-ARTHRITIS. A DISCRETE CHOICE ANALYSIS COMPARING TRAPEZECTOMY VS. AUTOLOGOUS FAT TRANSFER

Meyer-Marcotty[1], Reem Aljbaie[1], Jörn Redeker[2], Vincent März[3], Sören Könneker[3], Peter M. Vogt[3]
[1]Klinik für Plastische-, Rekonstruktive und Ästhetische Chirurgie, Handchirurgie, Klinikum Lüdenscheid, Germany; [2]Klinik für Plastische und Handchirurgie, Helios St.Johannes Klinik Duisburg, Germany; [3]Klinik für Plastische, Ästhetische, Hand und Wiederherstellungschirurgie, Medizinische Hochschule Hannover, Germany

Introduction: There are various options available for the treatment of CMC 1 Arthritis. Trapezectomy (TE) is the standard procedure. The autologous stem cell-enriched fat transfer (FatTx) into the arthritic CMC1-joint represents a minimally invasive, good alternative. With the help of discrete choice analysis, we would like to find out in this study which is the main criterion for patients with a CMC-1-arthritis having the choice between TE and FatTx.
Method: In this study, a discrete choice analysis, an investigation method established in market research, was carried out on 65 patients with CMC-1-arthritis on the question of treatment preference between TE and FatTx. The attributes of the therapy procedures for the discrete choice analysis were "duration of the cast" (4 weeks/1 week), "costs" (no costs/€700), "duration of treatment" (45 min/15 min) and "expected freedom from symptoms" (permanent/unknown).
These 4 attributes were combined with each other in every possible combination. The patients had no way of knowing what the "real" therapy constellations were. With 4 attributes, each with two possible characteristics, 16 different therapy constellations result from which our patients selected their preferred therapy alternative.
Result: In our experimental setup in question 1, the answer option "Method A" corresponds to the trapezectomy (4 weeks in a cast, no costs, 45 minutes of surgery and expected long-term therapeutic success) and the answer option "Method B" corresponds to the autologous fat transfer (1 week in a cast, €700 costs, 15 Minutes of operation and unknown duration of therapeutic success). The majority of patients chose method A over method B (67.7% versus 32.3%).
If method B was defined with the attributes 1 week of cast, free of charge, 15 minutes of operation time and expected long-term therapeutic success (question 6 of our questionnaire), 100% of our patients surveyed chose this therapy option.
The biggest factor influencing our patients' choice of therapy is long-term freedom from symptoms. When this was present, there was a 3.94 times higher chance that patients would have chosen this treatment.
The second biggest influencing factor in our patients' choice of therapy was the cost of the treatment. Here there was a 2.3 times higher chance that the patient would have opted for the free treatment.
Summary: With the help of discrete choice analysis, we were able to find out from our CMC-1-arthritis patients that

the expected postoperative freedom from symptoms has the greatest influence on the choice of therapy among the characteristics we predefined (comparison of TE vs. FatTx). In our experimental setup, we deliberately refrained from representing the FatTx too optimistically in order to exclude a possible bias in favor of the FatTx. We are aware that our statement is certainly limited by the strong simplification of the defined attributes inherent in the method. But the discrete choice analysis is an established method for representing customer/patient wishes, and thus we were able to identify the most important factor for CMC-1-arthritis patients when choosing differential therapy. This procedure could also be applied to other diagnosis with different treatment options.

A-0773 NERVE DECOMPRESSION IN THE LOWER LEG RESULTS IN AN IMPROVEMENT IN SYMPTOMS IN PATIENTS WITH BOTH DIABETIC AND IDIOPATHIC POLYNEUROPATHY

M Meyer-Marcotty[1], A Attabit[1], V März[2], P Vogt[2]

[1]Department of Plastic Surgery and Hand Surgery, Lüdenscheid Hospital, Lüdenscheid, Germany; [2]Department of Plastic Surgery and Hand Surgery, Hannover Medical School, Hannover, Germany

Background: Patients suffering from polyneuropathy often complain of pain, tingling and numbness sensations, as well as an increased risk of falling with the corresponding subsequent complications. If symptoms persist after conservative treatment options have been exhausted, nerve decompression in the lower extremity, as described by Dellon, can bring about an improvement in symptoms in many patients. Dellon originally reported that this surgery led to very successful outcomes in patients with diabetic polyneuropathy. In this study, we compare our post-surgical results in patients with diabetic versus idiopathic polyneuropathy.

Method: 33 patients with idiopathic or diabetic polyneuropathy who had undergone Dellon nerve decompression in the lower extremity between 2011 and 2013 were included in the retrospective study. Pain (NRS 0-10, 0= no pain, 10= worst imaginable pain), tingling, numbness, Hoffmann-Tinel sign and Semes-Weinstein monofilament were assessed in 20 patients with diabetic polyneuropathy and in 13 patients with idiopathic polyneuropathy

Results: Three months after surgery, a significant reduction in pain was evident in patients with diabetic polyneuropathy, from a preoperative level of NRS 4.9 (min. 0, max. 10) to 2 (min. 0, max. 8), (p=0.005). 90% of patients complained of tingling (p=0.000) before surgery and 18% after surgery, while 100% complained of numbness before surgery and 41% (p=0.000) after surgery. 100% of patients had no measurable surface sensitivity prior to surgery (measured with the Semes-Weinstein monofilament), while three months after surgery only 24% of patients still had no measurable surface sensitivity (P=0.000). A positive Hoffmann-Tinel sign was recorded in 85% of patients before surgery, and only in 11% three months after surgery (p=0.000). In the case of patients with idiopathic polyneuropathy, a reduction in pain was evident three months after surgery, from a preoperative level of NRS 3.9 (min. 0, max. 9) to 2.2 (min. 0, max. 9), (p=0.058). 77% of patients complained of tingling prior to surgery and 42% after surgery (p=0.111), while 92% complained of numbness before surgery and 50% after surgery (p=0.030). 77% of patients had no measurable surface sensitivity prior to surgery (measured with the Semes-Weinstein monofilament), while three months after surgery only 33% of patients still had no measurable surface sensitivity (P=0.047). A positive Hoffmann-Tinel sign was recorded in 62% of patients before surgery, and only in 17% three months after surgery (p=0.041).

Conclusion: Not only patients with diabetic polyneuropathy but also those with idiopathic polyneuropathy benefit from Dellon nerve decompression surgery in the lower extremities.

A-0775 COMPARISON OF WALANT AND GENERAL ANESTHESIA FOR HAND TRAUMA OPERATIONS

Nico Leibig, Roman Matros, Horst Zajonc, Steffen U. Eisenhardt, Ayla A. Hohenstein
Clinic for Plastic and Hand Surgery, University Medical Centre Freiburg, Germany

Introduction: WALANT has changed the routine of elective and trauma hand surgery. The benefits of WALANT are obvious. The local anesthesia can be done by the surgeon himself, without additional anesthesia. The patient is awake and no post-operative surveillance is necessary and intra-operative functional testing is possible. However, little date is available on potential effects of treating hand traumata in WALANT.
Aim: Aim of this study was to find out if performing hand trauma surgeries in WALANT leads to faster beginning of the operation by a consistent complication rate compared to operations with general anesthesia.
Material & Methods: A retrospective study was performed to detect differences between hand trauma operations performed in WALANT or general anesthesia. Therefore all hand emergencies of the category 2b (operations which should begin within the next 6 hours) performed between 2016 and 2024 at the University Medical Centre Freiburg, Germany were included.
Results: 817 patients (629 males and 178 females) were included. Different indications and operations were included, like extensor and flexor tendon repair, osteosynthesis and microsurgical nerve and vessel repair. All infections, burns, compartment syndromes and polytrauma patients were excluded from this study. The beginning of the operations with WALANT was 1.9 hours faster compared to general anesthesia, which was statistically significant. No differences in the complication rate between these groups were detected.
An additional matched-pair analysis was done to detect possible effects of different degrees of severity on the complication rate. This showed that complications did not differ between WALANT and general anesthesia also when matched on severity
Conclusions: Performing hand trauma surgery with WALANT leads to faster operative treatment with consistent complication rates compared to general anesthesia.

A-0776 ARTHROSCOPIC LESION-SPECIFIC CAPSULOLIGAMENTOPLASTY ACCORDING TO EWAS CLASSIFICATION SUBGRADING FOR CHRONIC DYNAMIC SCAPHOLUNATE INSTABILITY: A RETROSPECTIVE SINGLE SURGEON ANALYSIS OF 121 CASES WITH A MEAN FOLLOW-UP OF 25 MONTHS

Chul Ki Goorens[1], Sofie Peerlinck[1], Antoine van Ravesteyn[1], Kjell van Royen[2,3]
[1]International Wrist Center (IWC) Tienen Regionaal Ziekenhuis Tienen, Tienen, Belgium; [2]OLV Aalst, Aalst, Belgium; [3]Universitair Ziekenhuis Brussel, Vrije Universiteit Brussel, Brussel, Belgium

Introduction: Arthroscopy remains ithe ideal tool for assessment of scapholunate instability. Arthroscopic capsuloligamentoplasties have been described that aim to retighten the loosened scapholunate ligamentous complex.
Aim: In this retrospective study, arthroscopic lesion-specific capsuloligamentoplasty was evaluated.
Material & Methods: Preoperative scapholunate distance on radiographs and dorsal radioscaphoid translation on MRI, postoperative pain, flexion-extension arc compared to uninjured wrist, daily refunctioning, satisfaction and revision rate were assessed. EWAS grade 2 was treated with radiocarpal volar plicature or ADCLR, 3a with dorsal roundblock and radiocarpal volar plicature, 3b with dorsal roundblock, 3c with with dorsal roundblock and radiocarpal volar plicature, 4 with dorsal roundblock, ADCLR or RADICL and radiocarpal vola plicature.
Results: 121 patients, mean age 43 years (13-68) were operated by first author with mean follow-up of 25 months (12-41). Cyst was present in 38%. Trauma initiated instability in 39%. Mean preoperative scapholunate distance was 1,7 mm, while scapholunate distance was 2,3 mm on stress radiographs. On MRI, dorsal radioscaphoid translation was present in 11%.

Average time between onset of symptoms and surgery was 10,1 months. Arthroscopic assessment revealed EWAS grade 2 in 11%, 3a in 24%, 3b in 11%, 3c% in 53% and 4 in 16%. Mean pain decreased 62% after 4 months and 80% at final follow-up. Patients with EWAS 4 experienced pain decrease of 47% after 4 months and 58% at follow-up, while patients with EWAS 2-3 on average 65% after 4 months and 85% at follow-up. Flexion-extension range decreased compared to the contralateral wrist after 4 months on average by 36% (EWAS 2 by 19%, 3a by 18%, 3b 11%, 3c by 19% and 4 by 42%). Restart of their recreational and professional activities was on average after 4,8 months, with patients with EWAS 4 only after 8,4 months. Mean satisfaction was 8,0 out of 10, but only 6,4 for patients with EWAS 4. 88% of the patients would do the surgery again, but only 67% of patients with EWAS 4. Mean postoperative scapholunate distance was 1,9 mm, while scapholunate distance was 2,5 mm on stress radiographs. In 10%, an MRI was performed after on average 5 months postoperatively: the preoperative dorsal scaphoid translation was corrected in all patients. Revision surgery, mainly due to arthrofibrosis, was 3%.rnAccording to our results, scapholunate distance didn't change significantly, but radioscaphoid translation when present on MRI was corrected. Arthroscopic tailored capsuloligamentoplasty in EWAS 2 to 3 resulted in comparable and reproducible outcome. In contrast, this approach in EWAS 4 resulted less positive outcome than in EWAS 2-3: delayed restart of daily activities, increased pain and more loss of flexion-extension range, decreased satisfaction rate. It suggests that earlier treatment of scapholunate instability provides more predictable outcome. Addressing only the volar ligaments in EWAS 2, seems to provides sufficient stability. Combined volar to dorsal capsular stabilization in EWAS 3 did not decrease mobility compared to only dorsal stabilization.
Conclusions: This retrospective analysis was on a tailored approach of arthroscopic lesion-specific capsuloligamentoplasty for chronic scapholunate instability. Large, longterm prospective studies are required to increase evidence.

A-0777 THE ROLE OF ARTHROSCOPIC SCAPHOCAPITATE ARTHRODESIS IN KIENBOCK'S DISEASE– CASE REPORT

Joana Correia Rodrigues, Cláudio Garcia, João Cruz, Tiago Canas, Rute Santos Pereira, André Cunha, Renato Soares, João Gonçalves, António Rebelo
Hospital do Divino Espírito Santo de Ponta Delgada, Ponta Delgada, Açores, Portugal

Introduction: Kienbock's disease, also known as avascular necrosis of the lunate, is a rare condition that leads to progressive carpal collapse that results in early arthritis and degenerative changes. It affects most frequently men, especially between 20 and 40 years old. Usually, patients with this disease will need surgical treatment, since it is unfrequently to heal spontaneously. However, there is still no consensus about the best surgical treatment option. When compared with open procedures, wrist arthroscopy is superior in preserving joint mobility and it is related with better healing outcomes. Scaphocapitate arthrodesis has been reported as an effective procedure for the treatment of symptomatic patients with Kienbock's disease, due to the loading axis shifting toward the radioscaphoid joint.
Aim: to share a case report of a Kienbock's disease treated successfully with an arthroscopic scaphocapitate arthrodesis in our center.
Material & Methods: 25 years old male, without relevant personal history, was referred to an orthopedic appointment due to a right wrist pain with a few years of evolution, without any trauma episode. He presented right wrist range of motion limitation and reduced strength compared to the left side. Radiologically, he had Kienbock's disease (Lichman IIIa). He underwent surgery: arthroscopic scaphocapitate arthrodesis with 2 fully threaded headless screws and bone autograft from the homolateral distal radius, without complications.
Results: follow-up at 2, 4 weeks, 3, 6 and 12 months. He stayed immobilized with a posterior plaster for 4 weeks, after this time he started physiotherapy with good results. He returned to his job 3 months after the surgery. At the last

appointment, he had no pain complaints and presented improved strength, with still some range of motion limitations, but with no daily activity limitations. The last radiography showed bone healing on the right side and an initial Kienbock's disease in the left side, for which he maintains regular follow-up.
Conclusions: this case demonstrates a successful treatment of Kienbock's disease with an arthroscopic scaphocapitate arthrodesis and bone autograft, which can be an excellent alternative for managing this condition.

A-0778 DIRECT CONNECTION OF THE RADIAL WRIST EXTENSORS WITH THE SCAPHOLUNATE LIGAMENT COMPLEX

Ahmed Elsaftawy, Krzysztof Kowalewski
St. Jadwiga Slaska Hospital in Trzebnica, Poland, Plastic and Hand Suergry Department

Introduction: Is there a direct relationship between the the radial wrist extensors on the scapholunate ligament complex? The answer seems to be yes.
Aim: to investigate direct connection of the radial extensors of the wrist to the dorsal septum of the capsule articular to the scapholunate ligament.
Materials and Methods: MRI examination with contrast administered intra-articularly in both neutral and clenched fist positions was performed in 10 patients with wrist pain. The scapholunate angle was measured with an open and clenched hand respectively as well as the radioscaphoid angle, the degree of volar inclination of the scaphoid bone. The shortest distance between the short and long radial extensors and the scaphoid was also measured in both positions.
Results: an increase in the measured distance between the radial extensors and the scaphoid was observed in 7 patients in a closed fist position., in tow patients the distance was similar and reduced in one case. Additionally, in patients without symptoms of scapholunate instability, the scapholunate angle decreased slightly increasing. In patients with current and persistent scapholunate instability, the angle of scapholunate did not change. Limitations of the methodology -
1. non-standardized hand clenching force during MRI examination.
2. slight differences in hand position - e.g. the degree of dorsal/palmar bending of the wrist

Conclusions: There maybe a direct relationship between the radial wrist extensors and scapholunate complex through the dorsal septum of the joint capsule to the scapholunate ligament.

A-0779 SENSITIVE THUMB RECONSTRUCTION, OUR CENTRE'S REALITY

Carlotta Faccenda, Maria Concetta Rivellino, Carlo Rossello, Andrea Fanecco, Elisabetta Esposito, Alessandro Grondona, Vittorio Seghezzo, Andrea Zoccolan
San Paolo Hospital, Savona, Italy

Introduction: amputation of the thumb is a dramatic event for the functionality of the hand, potentially resulting in the loss of 40-50% of its function. Facing a thumb amputation of course our first intention is to proceed with a replantation, however sometimes the stump is not replantable or the replantation fails. On these occasions it is mandatory to think about reconstructive options. The reconstructive goal is to restore good function and aesthetics, all without pain.
Aim: The purpose of this presentation is to describe the reality of our centre in thumb-sensitive reconstruction. The literature is clear and well known, but not always applicable according to the situation and the patient's wishes.
Material & Methods: we re-evaluated some of our patients and the respective reconstructive options used. The choice was obviously based on the level of amputation and/or on the extension of tissue defects, but also in consideration of the patient-specific needs and the historical period in which these surgical procedures were performed.

Results: The aim was to obtain a thumb that was sensitive, soft and free of painful scars. Amputations distal to the interphalangeal are rarely functionally disruptive, and are generally manageable with local solutions, however, in very selected patients the absence of the nail may require partial great toe-to-hand transplantation. It is now well established in the literature that a transfer of great toe is the gold standard for thumb reconstruction. However, the patient is not always well disposed and in these cases alternative solutions must be identified and adapted to the situation. In proximal amputations and in the absence of the carpometacarpal joint, pollicization remains is the main choice.
Conclusions: The sensitive reconstruction of the thumb is essential for restoring the functionality of the thumb and whole hand. It is necessary for the surgeon to be familiar with the different techniques available in order to be able to adapt them to the type of injury, but also to the patient's needs and wishes in order to create a personalised treatment.

A-0780 EVALUATION OF SPLINT FIXATION IN FRACTURES AROUND THE METACARPOPHALANGEAL JOINT

Takahiro Maeda, Hideaki Ishii, Tomoyasu Homma, Misato Sakamoto, Shu Yoshizawa, Osahiko Tsuji, Hiroyasu Ikegami
Department of Orthopedic Surgery, Toho University Medical Center Ohashi Hospital

Introduction: External fixation in the intrinsic plus position is recommended for fractures around the MP joint. It is desirable to keep the MP joint in a 90-degree flexion position as much as possible; however, in reality, there are many cases where the flexion angle is small.
Aim: The purpose of this study was to evaluate the flexion angle of the MP joint in X-ray images after splint fixation for fractures around the MP joint and to investigate the appropriate fixation methods (materials, fixation range, angle of fixation device, etc.).
Material & Methods: We studied 320 cases of metacarpal fractures and 442 cases of proximal phalanx fractures registered at our hospital between April 2010 and December 2023. We extracted fractures around the metacarpophalangeal joint (distal metacarpal and proximal phalangeal fractures), selected 88 hands that had been immobilized with a fiberglass splint or aluminum splint (excluding casts), and had an accurate lateral hand radiograph. The primary outcome measure was the MP joint flexion angle, and the effects of the method of immobilization, material, angle of the immobilization device, and range of the immobilization device on MP joint flexion were statistically evaluated. The evaluation was based on X-ray images obtained at the next outpatient visit after the splint was fixed.
Results: The average age was 46±21.8 years, 37 female/51 male, and 42 proximal phalanx fractures/46 distal metacarpal fractures. The average MP joint flexion angle was 55±16.4 °, and 33 hands (38%) were able to maintain a flexion of 60 °or more. Those that covered the area distal to the PIP joint were able to maintain flexion significantly; when the splint flexion angle of the MP joint exceeded 90 °, flexion was not maintained. In addition, the older the age, the less flexion that was maintained
Conclusions: As only 38% of the cases were fixed in a flexion position of 60 °or more with splint fixation, it was found that appropriate splint fixation was necessary. In cases of fixation with a splint flexion angle of ≥ 90 °, the splint floated at the MP joint, resulting in insufficient fixation and failure to maintain the flexion position. In addition, the group with a flexion angle of less than 60 °had a significantly higher age, and it is difficult to maintain flexion in the elderly in particular, so we think it is good to use firm fixation and frequent outpatient visits to rewind or change to cast fixation as soon as the swelling improves.

A-0781 PREVALENCE AND CLINICAL IMPACT OF CHONDROPATHY IN PATIENTS WITH SCAPHOLUNATE LIGAMENT LESIONS

L van Wijk[1], JS Teunissen[1], EPA van der Heijden[1,2], SER Hovius[1,3]
[1]Department of Plastic, Reconstructive and Hand Surgery, Radboud Institute for Health Sciences, Radboudumc, Nijmegen, The Netherlands; [2]Department of Plastic, Reconstructive and Hand Surgery, Jeroen Bosch Ziekenhuis, 's-Hertogenbosch, Brabant, The Netherlands; [3]Hand and Wrist Center, Xpert Clinics, Amsterdam, The Netherlands

Introduction: Scapholunate ligament (SLL) injuries are a common cause of wrist instability, often resulting in progressive joint degeneration if untreated. While the consequences of chronic SLL lesions, such as scapholunate advanced collapse (SLAC) wrist, are well-documented, the role of concurrent chondropathy in patients with early-stage SLL lesions remains unclear.
Aims: This study investigates the prevalence of chondropathy in patients with isolated scapholunate ligament (SLL) lesions and examines its impact on treatment decisions following diagnostic wrist arthroscopy.
Methods: We conducted a retrospective cohort study of 226 patients with confirmed SLL lesions who underwent wrist arthroscopy between 2012 and 2021. Baseline data, including demographics, injury duration, and PRWHE scores, were collected. Arthroscopic findings focused on cartilage damage at specific wrist sites, with the prevalence of chondropathy analyzed per Geissler grade. Radiographic findings prior to arthroscopy were compared to arthroscopic observations to identify any discrepancies. Surgical treatments following arthroscopy, including SLL repair and salvage procedures, were recorded. Statistical analysis was performed to compare the presence of chondropathy across patient subgroups and to evaluate surgical treatment patterns, using chi-square, Fisher's exact, T-tests, and Kaplan-Meier time-to-event analyses
Results: Chondropathy was present in 33.2% of the study population and was more prevalent in older, male patients with severe SLL lesions and a history of wrist fractures ($p<0.04$). We found no differences in baseline pain and function scores. Chondropathy primarily affected the scaphoid and scaphoid fossa. Arthroscopy revealed more cases of chondropathy than radiographs, underscoring arthroscopy's sensitivity for detecting early-stage cartilage damage.
Patients with chondropathy did not undergo surgical treatment more frequently ($p=0.67$) but underwent salvage procedures at higher rates and earlier stages than those without chondropathy ($p<0.01$). Additionally, while only a small subset required secondary surgeries (5.3%), this was more common among patients without initial chondropathy, who often underwent more invasive procedures for SLL reconstruction or salvage procedures.
Conclusion: Chondropathy is a frequent finding in patients with isolated SLL lesions and may influence treatment pathways by increasing the conversion to salvage procedures. This highlights the need for further research into the clinical significance of chondropathy in SLL lesions and the effectiveness of early interventions to manage joint degeneration.

A-0782 INTEROBSERVER RELIABILITY OF THE EWAS CLASSIFICATION FOR SCAPHOLUNATE LIGAMENT PATHOLOGY

Johanna Viktoria Leon, Dane Peckston, Sara Farshidfar, Nicholas C Smith, Mohammed Baba
[1]Macquarie University Hospital, Sydney, Australia, [2]Norwest Private Hospital, Sydney, Australia, [3]SOULS research foundation

Introduction: Scapholunate ligament injury is difficult to accurately diagnose, and is often overlooked, particularly acutely. There are multiple reasons for this, including variation in the interpretation of clinical signs, limitations of 3D imaging modalities, and reliability of assessment techniques during arthroscopy.
Recently, the reliability of arthroscopy as an assessment tool to grade severity of injury has been questioned. Given that arthroscopy is an invasive procedure, with some inherent risk (arguably low) to the patient, it is imperative that surgeons

are confident that their assessment tools provide them with accurate information, particularly if their findings result in the recommendation for further surgery.
It is our experience that with adequate surgeon education, the EWAS classification system is a valid tool to assess and classify scapholunate injury. In turn, information obtained from arthroscopy can be combined with the clinical scenario and be incorporated into reliable management decisions for patients.
Aim: This study aims to investigate the validity of the EWAS classification system as a diagnostic tool
Material & Methods: After informed consent patients undergoing wrist arthroscopy were recruited by 2 primary surgeons. 19 videos were recorded and formatted into a Survey Monkey questionnaire. Subspecialist hand and wrist surgeons were invited to participate in the study via email sent to the New South Wales Hand Surgery Association mailing list. Responses were collated and statistical analysis was run to determine the interobserver reliability of the EWAS classification system between participating surgeons.
Results: 13 responses were available for statistical analysis. 62% of respondents had been in practice for less than ten years and no surgeons performed greater than 10 arthroscopies per month. Statistical tests for interobserver reliability revealed a Kappa score of 0.023 indicating slight agreement between pairs of responses
Conclusions: There is considerable variation in the responses provided by surgeons when asked to grade SL instability using the EWAS classification system. This limits the clinical reliability of the grading system. Further education of surgeons, a simpler classification system or a larger sample size (currently being recruited for this study) may improve these results.

A-0783 MANUFACTURING RELATIVE MOTION SPLINTS USING 3D PRINTING

David Gutierrez Medina, Ester Junyent Vilanova, Carlos Tata Rojas, Laia Berta Compte, Daniel Arribas Agüera
Hospital de Figueres, Figueres, Spain

Introduction: Relative motion splints have been an advancement in promoting early active mobility in extensor tendon injuries and other hand pathologies. They reduce adhesions and stiffness after immobilization and shorten recovery time. However, they require a trained physiotherapist to make and termoplastic materials which might not be available in some centers.
Aim: To manufacture and evaluate the usefulness of relative motion splints using 3D printing technology for various hand pathologies.
Material & Methods: The splints were designed using Tinkercad and processed with Meshmixer and Ultimaker Cura. They were printed on an FLSUN QQ-S printer using PETG material.
The approximate material cost was €0.15, and the manufacturing time was 30 minutes per piece. Post-printing, the splints underwent abrasive polishing.
Seven patients were included in the study. Six cases used extension-blocking splints: two for extensor injuries in zones IV-V, one for avulsion of the dorsal capsule of the metacarpophalangeal joint (MCPJ), and one for MCPJ pain that improved with the "pencil test." One case involved a flexion-blocking splint for treating an open boutonnière deformity. In three cases, the WALANT anesthetic technique was used.
Measurements of the patients' hands were taken, and treatment began five days after surgery. The resistance of the splints and the presence of skin lesions were evaluated. Patient satisfaction and adherence to treatment were assessed on a scale of 1 to 10. The time to start physical therapy, the number of sessions required before discharge, the total treatment time, and the limitations imposed by the splint on daily living activities and work were documented.

Results: No splint breakages or significant skin injuries were reported, except for mild irritation on the fourth finger in a fifth-finger injury. All patients tolerated the treatment, with an average satisfaction score of 8.7 out of 10. Patients used the splints for an average of 4.2 weeks and began physical therapy 2 to 4 weeks post-surgery, with a mean treatment duration of 4 weeks. Most patients were able to perform daily living activities, though two reported discomfort when closing the hand to lift weight.
Conclusions: Despite the small sample size, our initial results suggest that custom-made 3D-printed splints could be an alternative to thermoplastic splints in cases where thermoplastic materials are unavailable.

A-0784 FROM STUCK TO SMOOTH: OVERCOMING TRIGGER POINTS AFTER THUMB PROSTHESIS SURGERY – A CASE REPORT

Maria Tibau-Alberdi, Raquel Maroto-Rodríguez, Nieves Allué Fernández
Consorci SAnitari del Maresme-Hospital de Mataró, Spain

Introduction: Thumb carpometacarpal (CMC) joint arthroplasty is a common treatment for advanced osteoarthritis. Soft tissue complications, such as De Quervain's tenosynovitis, are known to occur postoperatively (16-18 %), but other less common complications such as deep infection or loosening can present diagnostic and therapeutic challenges. Here, we present a case of persistent pain at the thenar eminence following trapeziometacarpal prosthesis placement, effectively treated with ultrasound-guided trigger point injections with lidocaine.
Material & Methods: A patient underwent trapeziometacarpal prosthesis placement, initially demonstrating full range of motion and good radiographic results. However, three months postoperatively, the patient persisted with significant pain in the thenar musculature, particularly the Opponens pollicis when grasping objects. Ultrasonography showed no abnormalities.
Results: On physical examination, the patient had full joint mobility but presented with significant pain and an indurated, longitudinal area in the thenar eminence corresponding to the Opponens pollicis muscle. Three sessions of ultrasound-guided trigger point injections with lidocaine were performed. After the first session, the Visual Analog Scale (VAS) score dropped from 8 to 6; following the second session, it decreased to 4, and after the third session, it reduced further to 2. The patient regained the ability to work as a mechanic and could exert strength without pain. Quick Dash decreased 11 points after both ultrasound guided sessions
Conclusions: While one of the most described soft tissue complications following CMC arthroplasty is De Quervain's tenosynovitis, this case highlights the importance of considering alternative diagnoses when the first extensor compartment has already been addressed. It also underscores the effectiveness of ultrasound-guided trigger point injections in cases of muscle pain not attributable to typical tendon pathology. Notably, despite the patient's pain, the range of motion remained fully intact, which is an important consideration in similar clinical scenarios.

A-0785 PARADOXICAL LACERTUS FIBROSUS SYNDROME IN POST-TRAUMATIC ELBOW STIFFNESS

Federico Martinelli[1], Martina Coppola[1,2], Domenico Rodà[1,3], Clelia Rota[1,4], Andrea Celli[1]
[1]Hesperia Hospital, Modena, Italy; [2]University Federico II, Naples, Italy; [3]AOUC Careggi, University of Florence, Italy; [4]University of Turin, Italy

Introduction: Frequent sites of median nerve compression at the elbow are the lacertus fibrosus (LF) and pronator teres (PT), which can cause subtle clinical symptoms with negative electromyography (EMG).

Aim: This report has the objective to describe the median nerve compression caused by LF and PT in post-traumatic elbow stiffness with its peculiar clinical presentation and treatment.
Material & Methods: Were considered 5 cases of median nerve neuropathy and suffering of the brachial artery, with symptoms which were starting immediately after the beginning of physiotherapy for ROM recovery following elbow traumas.
Physical examination showed anterior pain at the proximal forearm associated with a McGowan grade 2 neuropathy of the median nerve.
Doppler ultrasonography (DUS) confirmed the compression of median nerve and brachial artery at the LF level with symptoms arising during passive and active extension as a paradoxical LF syndrome, triggered in a opposite way compared to the classic one which has symptoms worsening during active flexion. Additional compression of the median nerve at the PT level during active pronation was enlightened during DUS.
Patients were treated with surgical release of the LF and PT followed by elbow capsulotomy when needed due to stiffness.
Results: During first postoperative days was observed resolution from the pain and within 6 months was evaluated an excellent recovery of the nerve according to Messina criteria. No recurrency of the symptoms was noted after minimum 2 years of follow up.
Conclusions: Post-traumatic elbow stiffness can present with median nerve compression at the LF and PT with unusual clinical presentation. A rapid and accurate evaluation of the pathology can lead to a definitive treatment with optimal results.

A-0786 RECONSTRUCTION OF FLEXOR TENDONS IN ZONE 2 AFTER CHRONIC INJURIES: THE SIGNIFICANT CONTRIBUTION OF WIDE AWAKE ANESTHESIA

Andrea Marchesini, Francesco De Francesco, Olimpia Mani, Letizia Senesi, Michele Riccio
Azienda Ospedaliero universitaria delle Marche, Reconstructive Surgery and Hand Surgery department, Ancona, Italy

Introduction: Chronic injuries of the flexor tendons in zone 2 present a major reconstructive challenge due to the biological and anatomical characteristics of the tendons in this area. Over the years, several surgical techniques have been proposed for tendon reconstruction in this zone, ranging from the use of synthetic materials in a single-stage procedure to reconstructions using autologous tendon grafts in multiple stages. The advent of wide awake anesthesia, which allows for accurate intraoperative evaluation of tendon gliding and suture strength, has significantly improved the outcomes of these reconstructions in recent years.
Aim: We performed a retrospective review of patients treated at our center for chronic flexor tendon injuries in zone 2 between 2003 and 2023. Chronic injury was defined as any complete tendon rupture that was referred to our center more than 30 days after the trauma. We compared patients who underwent surgery with plexus anesthesia to those who were operated on with wide awake anesthesia.
Material & Methods: Our series included 50 patients, of whom 29 underwent surgery with plexus anesthesia and 21 with wide awake anesthesia. Of these 50 patients, 13 underwent direct tendon repair of the deep flexor tendon, while the remaining 37 were treated with a two-stage reconstruction of the deep flexor tendon using the Hunter technique.
Results: Due to the small sample size, a statistically significant difference was observed only in the number of excellent results, as assessed by the Strickland criteria, between the group treated with two-stage reconstruction using plexus anesthesia and the group treated with wide awake anesthesia. A significant increase in excellent results was demonstrated with the introduction of wide awake anesthesia. The trend of improvement in outcomes was also confirmed for the "good"

result category, and even within the group undergoing direct tendon repair when wide awake anesthesia was used
Conclusions: Wide awake anesthesia proves to be a useful and indispensable tool in the armoury of the hand surgeon who nowadays engages in flexor tendon surgery.

A-0787 COURSE OF HAND AND WRIST COMPLAINTS

Patrick Krastman[1], Yisha He[1], Gerald Kraan[2,3], Rianne Oomen[2,3], Nina Mathijssen[2,3], Sita Bierma-Zeinstra[1], Jos Runhaar[1]
[1]Erasmus MC University Medical Center Rotterdam, Rotterdam, Netherlands; [2]Reinier de Graaf Groep, Delft, Netherlands; [3]Reinier Haga Orthopedisch Centrum, Zoetermeer, Netherlands

Introduction: The care for patients with hand and wrist complaints is challenging, due to the unknown course of pain/function. By describing the course and the association with possible predictive factors, clinicians can manage their patients more adequately.
Aim: To describe the course of pain/function in wrist and hand complaints and to examine the association between baseline characteristics and 12-month recovery.
Material and Methods: This study comprised patients aged 18 years who were referred to the radiology department for traumatic and non-traumatic wrist and/or hand complaints, with data collected at baseline, 6 weeks, 3 and 12 months after presentation. This study analyses baseline data, which includes several variables (e.g. age, sex, body mass index (BMI), occupation status, workload, dominant hand, affected hand/wrist, duration of complaint, history of trauma), and also questionnaires at the other measuring moments, such as the Patient-Rated Wrist and Hand Evaluation (PRWHE), Functional Comorbidity Index (FCI), Numerical Pain Rating Scale (NPRS), Hospital Anxiety and Depression Scale (HADS), and Pain Catastrophizing Scale (PCS). SPSS (version 28.0.1.0) was used for data analysis to describe baseline characteristics and assess correlations between baseline characteristics and course op complaints as measured by the PPRO. PPRO (7-point Likert scale) was dichotomized in recovered ('complete recovery' to 'slightly improved') and not-recovered ('no change' to 'worse than ever').
Results: The cohort comprised 387 patients (63% female, mean age 58 years (SD 16.5), mean BMI 25.5 (SD 5.8)). The occupation status was full-time paid work (26%), part-time paid work (21%), occupational disability (3%), and others (50%). Physical workload levels were distributed as follows: no work (34%), light work (35%), moderate work (22%), and heavy work (9%). The right hand was dominant in 54% of patients, which was affected in 86% of patients. A history of trauma was reported in 42%. The mean duration of complaints was 33 weeks (SD 91.1). At baseline, NPRS mean score was 3.9 (SD 2.5), PRWHE mean score for pain and function were 16.4 (SD 12.5) and 28.9 (24,7), the median of the FCI was 1 (IQR 2), PCS mean was 8.9 (SD 10.5), and the HADS mean score for anxiety and depression were 3.3 (SD = 3.2) and 3.1 (SD = 3.1), respectively. The state of recovery (PPRO) was 82% after 12 months.
Regression analysis showed significant associations between 'not recovered' (PPRO) at 12 months and history of trauma (OR 0.02 CI95% 0.01-0.46), paid work (vs other categories) (OR 0.19 CI95% 0.02-0.45), duration of complaints (OR 1.0 CI95% 1.0-1.01), depression (OR 1.16 CI95% 1.00-1.34), NPRS (OR 1.27 CI95% 1.04-1.56), BMI (OR 1.9 CI95% 1.01-1.17), and dominant hand (OR 3.3 CI95% 1.04-10.60) at baseline.
Conclusions: More women than men presented with hand/wrist complaints for X-ray examination. In most patients the dominant hand was affected. Patients who had a paid job and whose hand and wrist complaints were caused by trauma had a greater chance of recovery after 12 months. Dominant hand, duration of complaints, pain, and depression were associated to a greater change of no recovery after 12 months.

A-0788 CORRECTIVE OSTEOTOMIES OF THE UPPER LIMB: FROM HUMERUS TO PHALANGES

Valerio Monteleone, Jane C Messina, Paolo Arrigoni, Pietro S Randelli
First Orthoapedic Clinic, University of Milan, Gaetano Pini CTO Orthopaedic Institute, Milan, Italy

Introduction: Malunions of fractures of the upper limb can cause deformity, pain, restriction of range of motion, reduction of strength and at later stages development joint osteoarthritis. The indications to treatment are young and symptomatic patients but also older patients with an active life. The classical method of measurement of bone and joint axis of the different upper limb bones on XRays are very useful, but also comparative XRays, as well as CT scan which is mandatory in order to understand the tridimensional aspects of malunion. Custom made plate and engineer assisted osteotomy guide systems can be useful in selected cases in complex malunions. Aim of the study is evaluate the results of the treatment of malunions of the upper limbMaterial & Methods: From 2019 to 2024 we have treated 31 malunions of the upper limb: 6 distal humerus, 12 radius, 1 forearm, 6 ulna, 2 metacarpals, 4 phalanges. Mean age 38 (12- 70 yo), 8 females and 21 males. Mean pre-operative DASH was 43 15, mean VAS was 7.3 0.7, mean Mayo 46.5 11, mean PRWE 57.7 19, mean Grip 15 7.3Kg. Closing wedge osteotomy was used for distal humerus and ulna, open wedge for the rest of the patients, in two cases bone graft was used. The majority of patients were treated with plate and screw fixation, one kid was treated with K wires and external fixation was used in distal phalangeal correction. In one case of forearm complex malunion engineer assisted guide system was used. Patients were reviewed with a mean follow up of 18 months (6 – 68 months) with XRays Results: all patients obtained an excellent score with the Mayo wrist score or Mayo Elbow score with an excellent recovery of function at Follow-up. All malunion united. One case of distal radius had a partial loss of radiographic correction at FU and one elbow had a residual stiffness of 20° in extension (already present in the pre-op). Mean scores improved post-operatively in a statistically significant way: mean DASH was 7.8 11 ($p<0.01$), mean PRWE was 6.6 2 ($p<0.01$), VAS 0,5 0.8 ($p<0.01$), mean Grip 25 5.1 ($p<0.05$)Conclusions: corrective osteototomies allow optimal correction of post-traumatic upper limb deformities in order to improve function and prevent osteo-arthritis. The preoperative planning is essential with Xrays and CT scans. Custom made systems are useful in selected cases. Modern internal fixation systems allow an optimal correction and stabilization of the fragments. Osteotomies are indicated in young patients with malunions of the upper limb bones but also in older symptomatic, active and independent patients.

A-0789 FUNCTIONAL OUTCOMES OF DORSAL VS. LATERAL PLATE FIXATION IN UNSTABLE PROXIMAL PHALANGEAL FRACTURES OF THE HAND

Grigorios Kastanis[1,2], Mikela-Rafaela Siligardou[2], Konstantinos Zampetakis[2], Constantinos Chaniotakis[2], Alexandros Tsioupros[2], Anna Pantouvaki[1,3], Ioannis M Stavrakakis[2]
[1]Reconstructive Hand Surgery Unit, Venizeleio General Hospital of Heraklion, Crete, Greece; [2]Department of Orthopaedic, Venizeleio General Hospital of Heraklion, Crete, Greece; [3]Department of Physiotherapy, Venizeleio General Hospital of Heraklion, Crete, Greece

Introduction: Proximal phalangeal fractures are common injuries of the hand, and surgical fixation is recommended for unstable cases. There is ongoing debate regarding the selection of the appropriate surgical treatment.
Aim: The aim of this study was to analyze the clinical outcomes following the surgical management of these fractures using mini locking plates applied in two different positions: dorsal versus lateral.
Material & Methods: Fifty-eight patients with closed unstable proximal phalangeal fractures of the hand were managed with open reduction and internal fixation (ORIF) using mini locking plates, between January 2020 and June 2023. Thirty-four

cases were male, and twenty- four were female, with an average age of 46.7 years. Fractures were classified based on the Orthopaedic Trauma Association (OTA) classification using preoperative X-rays. Thirty-six fractures were diaphyseal (OTA types 78-A2, B2, C2), and twenty- two were non-diaphyseal. In twenty- six cases, the plates were applied dorsally (group A), and in thirty- two cases, they were applied laterally (group B). All patients were assessed during a 1-year follow-up period. Visual Analogue Scale (VAS) score, total active motion (TAM), and the Quick Disabilities of the Arm, Shoulder & Hand (DASH) score were used to evaluate the clinical outcomes of patients postoperatively

Results: In group A, the average VAS score was 14/100. TAM, according to Duncan's criteria, was excellent in 14 patients, good in 5 patients, and fair in 7 patients. The average Quick DASH score was 27.1. In group B, the average VAS score was 8/100. TAM was excellent in 25 patients, good in 6 patients and fair in 1 patient. The average Quick DASH score was 17.2. All the above indices refer to the final follow-up. Delayed union was present in 2 cases of group A. In 35 cases, the plate was removed 6 months postoperatively, at the patients' request. Tenolysis was performed in 9 patients of group A to restore TAM, with excellent results, after the completion of the final follow-up. No postoperative infections were observed in the two groups.

Conclusions: Our results shows that clinical outcomes of ORIF with mini locking plates in the surgical management of patients with unstable proximal phalangeal fractures are favorable, advocating the efficacy of this technique. Probably, the placement of the plate laterally yields better functional outcomes, but the result may be unreliable due to the small sample size of the patients.

A-0790 TREATMENT OF SAGITTAL PLANE INSTABILITY OF THE PROXIMAL INTERPHALANGEAL JOINT: ULTRASOUND-GUIDED VOLAR PLATE SCARIFICATION TECHNIQUE

Barrera-Ochoa, Sergi[1], Prieto-Mere, Jose Antonio[1], Ibañez, Federico[2], Font, Eduard[1], Sosa, Gustavo[1], Martinez, Julio[1], Soldado, Francisco[3]

[1]Institut de la Mà, Hospital Universitari General de Catalunya, Barcelona, Spain; [2]Universidad Autónoma de Barcelona, Bellaterra, Barcelona; [3]Pediatric Hand Surgery and Microsurgery Unit. Barcelona University Children's Hospital HM Nens, HM Hospitales. Barcelona, Spain

Introduction: Joint instability can result from different factors, such as a rupture of the volar plate (VP), collateral ligament tears, or fractures near the middle phalanx's base.

Laxity in the volar plate of the proximal interphalangeal joint (PIP) can result in sagittal plane instability due to its incompetence, accompanied by digital hyperextension with dorsal subluxation, loss of functionality, and pain.

Aim: Present a series of cases of patients with sagittal instability of the volar plate of the proximal interphalangeal plate treated with a minimally invasive surgical technique and evaluate the short and medium-term results.

Material & Methods: A prospective study was conducted involving five patients with ages between 18 and 38 diagnosed with sagittal plane instability of the PIP joint, attributed to VP incompetence.

These patients underwent a novel surgical intervention, with a minimum follow-up period of ten months (averaging twelve months) established for assessment. The procedure was performed during a scheduled clinic visit with the patient seated and conscious, under digital anesthesia. It involved ultrasound-guided percutaneous scarification of the PIP joint's VP using a 23G intramuscular needle (1.2 mm diameter).

Following the intervention, the patient's finger was splinted with a thermoplastic dorsal splint set at a 30° flexion angle for the PIP joint, allowing immediate postoperative full finger flexion. To evaluate outcomes, PIP hyperextension was measured with a goniometer, and the hyperextension block was assessed through a physical examination. Pain levels were

recorded using a Visual Analog Scale (VAS). Functional outcomes were assessed using the Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) and the Mayo Wrist Score (MWS). Grip strength was evaluated with a dynamometer, and the range of motion in flexion and extension was recorded in degrees. Evaluations and questionnaires were administered to assess and compare outcomes between the affected and unaffected hands at the day of the procedure, prior to any intervention, and at postoperative weeks 6, 12, 24, and 54.
Results: The rate of resolution of PIP hyperextension was 100% at 6, 12, 24, and 54 weeks. The rate of resolution of hyperextension block was 100% at 6, 12, 24, and 54 weeks. Pain decreased after the procedure, and patients experienced improvements in both the QuickDASH and Mayo Wrist Score (MMWS). Grip strength increased by 31% after the procedure. The range of motion in the extension of the PIP treated showed significant changes compared to preoperative measurements (mean extension deficit of 7°, range -15° to 0°). In the final follow-up, there were no differences between the treated and untreated (healthy) hands in terms of digital joint balance or grip
Conclusions: There are promising results for the treatment of sagittal instability of the PIP joint using a minimally invasive ultrasound-guided technique, minimizing risks to adjacent structures. This approach simplifies the treatment, avoiding surgical approaches, infection risks, and operative anesthetic risks, with a shorter hospital stay and minimal follow-up for wound care. The rehabilitation protocol is more comfortable for the patient, yielding positive long-term results with a preserved range of motion and strength compared to the contralateral side.

A-0791 CAMITZ OPPONENSPLASTY WITH PALMARIS LONGUS TENDON FOR SEVERE CARPAL TUNNEL SYNDROME IN ELDERLY PATIENTS

Takahiro Asano[1,2], Haruhiko Satonaka[1], Ryoji Suzumura[1], Yohei Yamabe[1], Kakunoshin Yoshida[1], Masahiro Hasegawa[2]
[1]Ise Municipal General Hospital, Mie, Japan; [2]Department of Orthopaedic Surgery, Graduate School of Medicine, Mie University, Mie, Japan

Introduction: Advanced age is considered a risk factor for poor outcomes after carpal tunnel release in carpal tunnel syndrome (CTS). Some reports suggest simultaneous opponensplasty for severe CTS. This study investigated postoperative outcomes of modified Camitz opponensplasty in patients aged 80 years and older.
Methods: From January 2019 to May 2024, 62 patients (66 hands) with severe CTS underwent modified Camitz opponensplasty. Patients with at least 6 months of follow-up were included. The mean age at surgery was 76 years (range: 42–90 years), and the mean follow-up period was 13 months (range: 6–67 months).
The surgical procedure included carpal tunnel release and transfer of the palmaris longus tendon, fixed to the dorsoradial base of the proximal phalanx of the thumb using a suture anchor. Grip strength, tip pinch strength, and lateral pinch strength were measured preoperatively, 6 months postoperatively, and at the final follow-up to assess progression. The cohort was divided into two groups: Group E (≥80 years old, 31 hands) and Group Y (<80 years old, 35 hands) for comparative analysis
Results: Preoperative grip strength, tip pinch strength, and lateral pinch strength averaged 16.4 kg, 3.1 kg, and 5.0 kg, respectively. At 6 months postoperatively, these values were 15.2 kg, 3.9 kg, and 5.2 kg, showing no significant changes. However, at the final follow-up, they improved to 17.7 kg, 4.0 kg, and 5.4 kg, with significant increases observed in grip strength and tip pinch strength.
The changes in grip strength, tip pinch strength, and lateral pinch strength from preoperative to 6 months postoperative were +1.1 kg, +0.7 kg, and +0.9 kg in Group E, and +1.7 kg, +0.1 kg, and -1.2 kg in Group Y, with no significant differences between the groups. Similarly, the changes up to the final follow-up were +1.4 kg, +1.1 kg, and +1.2 kg in Group E, and +1.3 kg, +0.9 kg, and +0.3 kg in Group Y, with no significant intergroup differences observed.

Discussion: In elderly patients, dissatisfaction due to persistent symptoms after carpal tunnel release has been reported. This study showed that opponensplasty for severe CTS improved grip and pinch strength in patients aged 80 years and older, with outcomes comparable to younger patients. These findings suggest that opponensplasty is an effective surgical option to improve function in elderly patients with severe CTS.

A-0792 OUTCOMES OF SILICONE ARTHROPLASTY FOR OSTEOARTHRITIS OF THE DIP JOINT

Haruhiko Satonaka[1], Takahiro Asano[1], Kakunoshin Yoshida[1], Yohei Yamabe[1], Ryoji Suzumura[1], Masahiro Hasegawa[2]
[1]Ise Municipal General Hospital, Ise, Japan; [2]Mie University, Graduate School of Medicine, Tsu, Mie

Introduction: The hand osteoarthritis (HOA) is common disease, with the distal interphalangeal (DIP) joint being most frequently affected. When severe pain limits daily activities, surgical treatment is considered. While arthrodesis is widely recognized as the gold standard, it leads to permanent joint immobility, which may cause dissatisfaction in patients. Silicone arthroplasty, although less commonly performed, has the potential to relieve pain while preserving joint mobility. This study evaluates the clinical outcomes of silicone arthroplasty in patients with osteoarthritis of the DIP joint.
Materials and Methods: Thirteen patients (19 fingers) who underwent silicone arthroplasty for DIP joint osteoarthritis were included in this study. There were 2 men (2 fingers) and 11 women (17 fingers) with a mean age of 66 years. Affected fingers included 6 index fingers, 9 middle fingers, 3 ring fingers, and 1 little finger. The average follow-up period was 22 months postoperatively.
Surgery was performed using a dorsal Y-V incision to approach the DIP joint. The extensor tendon was divided 5 mm proximal to its insertion on the distal phalanx using a step-cut technique. The head of the middle phalanx was excised at the attachment of the collateral ligaments, and the distal phalanx was prepared without osteotomy for implant insertion. In cases with lateral instability, the collateral ligament attachments were reinforced with 4-0 high-strength polyethylene sutures to restore soft tissue balance. Clinical outcomes were assessed preoperatively and at the final follow-up using pain (VAS), range of motion (arc), extension lag, and the presence of instability
Results: Pain VAS improved significantly, with resting pain scores decreasing from 24 mm preoperatively to 0 mm postoperatively and motion-related pain VAS decreasing from 58 mm to 3 mm. The range of motion (arc) increased from 39° preoperatively to 46° postoperatively. Extension lag improved from −23° to −6°. Preoperatively, lateral instability was observed in 13 fingers; postoperatively, it persisted in only 2 fingers.
Discussion: Arthrodesis is effective in achieving pain relief and is considered the gold standard for DIP joint osteoarthritis. However, it is technically demanding and carries a risk of nonunion. Additionally, the resulting joint immobility can lead to patient dissatisfaction. Silicone arthroplasty offers an alternative by preserving joint mobility and demonstrating favorable outcomes in terms of pain relief and function. Despite these benefits, challenges remain, including residual instability and the potential for recurrent deformity. Long-term follow-up is necessary to assess the durability of the results and address potential complications.
Conclusion: Silicone arthroplasty for DIP joint osteoarthritis provides effective pain relief and preserves joint mobility, making it a viable alternative to arthrodesis in selected patients. While the short- to mid-term outcomes are promising, further studies with longer follow-up are required to validate its long-term efficacy.

A-0793 FINGERTIP AESTHETIC OUTCOME IN COMPLETE SYNDACTYLY RELEASE

Kresimir Bulic[1,2]
[1]University Hospital Zagreb, Zagreb, Croatia; [2]University of Zagreb School of Medicine, Zagreb, Croatia

Introduction: An aesthetically pleasing fingertip is an important but often under evaluated goal in syndactyly release
Material & Methods: We assessed the aesthetic fingertip outcome in 26 patients with complete syndactylies, with a total of 94 separated digits, using a four-grade scale based on the quality of the lateral nail fold, nail plate definition, symmetry and pulp fullness.
Results: Fingertips with complete simple syndactylies released with the use of full-thickness skin grafts achieved a significantly better aesthetic result then fingertips with complete complex syndactylies released with the use of Buck-Gramcko pulp flaps. Fingertips involved in complex syndactylies achieved significantly better aesthetic results when reconstructed using Buck-Gramcko flaps in comparison with those reconstructed with full-thickness skin grafts
Conclusions: We recommend the use of Buck-Gramcko flaps in complete complex syndactylies, while reserve the traditional zig-zag and full-thickness skin graft closure for cases of complete simple syndactylies. We also propose a grading system for the aesthetic outcome of the fingertip following syndactyly release.

A-0794 ENHANCED OUTCOMES IN FOREARM MALUNION CORRECTION: THE ADDED VALUE OF PATIENT-SPECIFIC GUIDES IN IMPROVING RANGE OF MOTION AND SURGICAL EFFICIENCY

Eline van Es[1], Filip Stockmans[2], Joost Colaris[1]
[1]Erasmus Medical Center, Rotterdam, The Netherlands; [2]AZ Sint-Jan and AZ Sint-Lucas, Brugge, Belgium

Introduction: Forearm fractures are common in children, with secondary displacement occurring in 30% of cases treated with a cast, potentially leading to malunion. Malunion can cause pain, loss of cosmetic appearance, and functional limitations, particularly impaired forearm rotation. While 3D virtual planning and patient-specific guides are promising for correcting malunion via osteotomy, it remains uncertain whether these techniques improve outcomes, especially forearm rotation.
Aim: This randomized controlled trial aims to evaluate the clinical outcomes of forearm malunion corrective osteotomies by comparing two approaches: preoperative 3D virtual planning with and without the use of patient-specific guides. The primary outcome is forearm pronation and supination one year postoperatively, assessing whether patient-specific guides enhance functional recovery.
Secondary outcomes included surgical time, incision length, and complications.
Material & Methods: This study included children (≥6 years) and adults with symptomatic malunion of the midshaft radius and/or ulna, where correction by growth is unlikely. Patients had significant rotation limitation (<50° pronation/supination), arm complaints, and full fracture healing, with informed consent. Exclusions include malunion of the distal radius or significant issues in the contralateral arm. Thirty patients were randomized to undergo osteotomy with or without patient-specific guides, using advanced 3D planning software and optional soft-tissue release. Post-surgical care included individualized rehabilitation. Measurements of pronation and supination were performed at baseline, and at 3, 6, 9 and 12 months of follow-up.
Results: In both groups, pronation, supination, and total range of motion (ROM) significantly improved from baseline to one year postoperatively. The average total ROM at baseline was 53% of the contralateral side, increasing to 95% in the group with patient-specific guides and 86% in the group without guides after one year.

In the group with patient-specific guides, pronation (72° (SD 12) vs 63° (SD 12) and total ROM (160° (SD 13) vs 145° (SD 18)) were significantly better compared to the group without patient-specific guides, whereas no significant difference was observed for supination (88° (SD 6) vs 83° (SD 12)).
Surgical time was reduced by 20 minutes per bone in the group with patient-specific guides, while the incision length was 3 cm shorter per bone in this group.
In the group without patient-specific guides, two patients required reoperation within one year, this time using guides
Conclusions: Patient-specific guides are recommended for forearm malunion corrective osteotomies, as they significantly improve pronation and total ROM, reduce surgical time and incision length, and minimize reoperation risk.

A-0795 DYNAMIC IMAGING OF THE WRIST: ANATOMICAL SHAPE VARIATIONS DO NOT AFFECT KINEMATIC PARAMETER EXTRACTION

Maranda Haenen[1,2,3], Stefan Hummelink[2], Eline Karstanje[4], Ioannis Sechopoulos[3,4,5], Brigitte van der Heijden[1,2]
[1]Department of Plastic and Reconstructive Surgery, Radboudumc, Nijmegen, the Netherlands; [2]Department of Plastic and Reconstructive Surgery, Jeroen Bosch Hospital, 's-Hertogenbosch, the Netherlands; [3]Department of Medical Imaging, Radboudumc, Nijmegen, the Netherlands; [4]Technical Medicine Center, University of Twente, Enschede, the Netherlands; [5]Dutch Expert Centre for Screening (LRCB) Nijmegen, the Netherlands

Introduction: Four-Dimensional Computed Tomography (4DCT) shows promise in diagnosing wrist pathologies, such as scapholunate ligament (SL) lesions, non-invasively. The diagnosis of an SL injury in 4DCT currently relies on detecting pathologic changes in kinematic parameters like the carpal angles. For this, defining a unique 3D local coordinate system (LCS) for each bone is essential to define the axes for carpal angle estimation. However, anatomical variations can affect LCS definitions and, therefore, influence the derived carpal angles, compromising comparability across subjects and limiting the diagnostic value of these parameters. Thus, this study aims to determine the effect of natural bone shape variations on the accuracy of the LCS and subsequent estimated carpal angles.
Methods: A dataset consisting of 119 4DCT scans was used for this study. Low-quality scans were excluded, as well as scans of wrists with severe arthrosis, old fractures or other abnormalities regarding the bone shapes. This resulted in 106 usable scans for the carpal bones and 99 scans for the radius. The selected scans were automatically converted to 3D models using an artificial intelligence-based segmentation algorithm. A statistical shape model (SSM) was created separately for each bone to quantify the anatomical variations in the set using commercial software (MATLAB version: 9.13.0 (R2022b), The MathWorks Inc., Natick, Massachusetts). The SSM was then used to create new bone shapes based on naturally occurring anatomical shape variations. A method to automatically place the LCS in each bone and estimate two carpal angles, the scapholunate angle (SLA) and capitolunate angle (CLA), was created and implemented in MATLAB and used on all the newly generated bone shapes. The total rotational deviation of the LCSs was then calculated by a combined rotation around the three axes (x, y, and z axes). Finally, the SLAs and CLAs were calculated for all possible bone shape combinations and their variability was characterized using the 95th confidence interval.
Results: SSMs of the carpal bones and radius were successfully created, and over 2000 new bone shapes were generated. The 95th percentile of the rotational deviations of the LCSs of all generated carpal bones and radii were below 3°. The resulting uncertainty due to anatomical variations in the calculation of the SLA and CLA was 2-3°.
Conclusion: Anatomical shape variations have minimal impact on the localization of LCSs and consequently minimally affect SLA and CLA estimations. This finding suggests that this method to estimate the carpal angles is well-suited for future investigations exploring the potential of automatic carpal angle calculations in 4DCT scans to distinguish healthy wrists from those with an SL lesion.

A-0796 AN IMMERSIVE VIRTUAL REALITY SERIOUS GAME FOR HAND AND FINGER REHABILITATION: INITIAL FINDINGS FROM A RANDOMIZED CONTROLLED TRIAL

Cosima Prahm[1], Michael Bressler[2], Joachim Merk[2], Tanja Gohlke[2], Leila Harhaus[1], Adrien Daigeler[2], Jonas Kolbenschlag[2]
[1]Department of Hand-, Replantation and Microsurgery, BG Klinik Unfallkrankenhaus Berlin, Charité University Medicine, Berlin, Germany; [2]Department of Hand, Plastic, Reconstructive and Burn Surgery, BG Klinik Tübingen, University of Tübingen, Germany

Introduction: Rehabilitation of hand and finger function following traumatic injury requires consistent and focused exercise. However, adherence often diminishes due to the monotony of repetitive tasks or the discomfort they may cause, leading to exercises being performed poorly or avoided altogether. Incorporating gamification into these tasks can make them more engaging, enhancing patient motivation to maintain regular exercise.
Aim: This study aimed to iteratively develop and refine a serious virtual reality game for hand and finger rehabilitation, providing a stimulating and engaging digital environment to sustain patient motivation for at least two weeks of continuous therapy.
Material & Methods: The development process involved three distinct stages, each subjected to rigorous evaluation. A prototype encompassing core game functionalities was first tested with 18 healthy participants and 7 patients with hand impairments. Based on this feedback, version 1 of the game was developed and evaluated with 20 patients divided into an investigation and a control group. Further insights informed the creation of version 2, which underwent evaluation with another cohort of 20 patients, similarly divided. Motivation was assessed using the Intrinsic Motivation Inventory (IMI), while the game's quality was rated using the Mobile Application Rating Scale (MARS) and the System Usability Scale (SUS). Feedback was collected through semi-structured interviews to guide iterative development.
Results: Prototype evaluation confirmed the feasibility and acceptance of the game design. Version 1 significantly improved motivation on the IMI subscales for effort ($P<.001$) and usefulness ($P=.02$). Version 2 further increased daily exercise adherence ($P=.008$) and motivation on the IMI effort subscale ($P=.02$). Both versions received high MARS scores, with version 2 achieving an excellent SUS score of 86.9. User feedback from interviews was instrumental in enhancing the content and functionality of the game across development stages.
Conclusions: This study introduced a virtual reality serious game tailored for hand and finger rehabilitation. The game was highly accepted by users, effectively improving motivation and adherence. Iterative development based on user feedback ensured the game's usability and adaptability, making it accessible even for patients with severe hand function limitations.

A-0799 PRE-OPERATIVE DIAGNOSIS OF LIGAMENT LESIONS OF THE WRIST. CAN WE RELY ON MRI?

Luca Hergar[1,2], Judit Reka Hetthessy[3,4]
[1]Semmelweis University, Department of Orthopaedics; [2]Semmelweis University, Centre for Translational Medicine; [3]Semmelweis University School of PhD Studies Workgroup for Science Management; [4]Hand Clinic, Budapest, Hungary

Introduction: Ligament lesions of the wrist are commonly assessed with MRI. Precise early diagnosis of triangular fibrocartilage complex (TFCC), scapholunate (SL) ligament and lunotriquetral (LT) ligament injuries is crucial, for both conservative and surgical treatment plans.
Aim: To assess diagnostic accuracy, positive and negative predictive values of wrist MRI for TFCC, SL and LT ligament lesions.
Material & Methods: A systematic search was conducted using MEDLINE, Embase and CENTRAL databases. Studies published before the 12 th of February 2024 assessing the diagnostic accuracy of wrist MRI compared to arthroscopy were included to our analysis.

Papers examining pediatric populations were excluded. We have conducted a meta-analysis to determine overall diagnostic accuracy. Subgroups were created based on MRI filed strength (low filed, 1.5T and 3T). The difference between subgroups was assessed with two-tailed z-tests.
Results: Out of 5181, 37 eligible articles were included to the analysis. Thirty studies reported on TFCC lesions, 24 on SL lesions, and 14 on LT lesions. The best accuracy was observed at peripheral TFCC lesions (se: 0.90 (CI: 0.66-0.98), sp: 0.95 (CI: 0.88-0.98)). We have found high accuracy for central TFCC tears as well (se: 0.85 (CI: 0.70-0.93), sp: 0.95 (CI: 0.81-0.99), however for TFCC injuries in general both sensitivity and specificity were lower (se=sp: 0.82 (CI: 0.75-0.87). For SL and LT lesions sensitivity was 0.63 (CI: 0.50-0.74) and 0.41 (CI: 0.25-0.60), while specificity was 0.86 (CI: 0.73-0.93) and 0.93 (0.81-0.98).
Positive predictive value (PPV) was highest for peripheral TFCC tears (0.87) and lowest for LT ligament lesions (0.67). Negative predictive value (NPV) was also highest for peripheral TFCC tears (0.94) and lowest for SL ligament lesions (0.70). Mean PPV was 0.77 and mean NPV was 0.81.
There was no significant difference between subgroups based on MRI field strength.
Conclusions: MRI was found to be the most accurate in case of peripheral and central TFCC tears. Clinicians should be aware that accuracy for SL and LT ligament tears is lower. Mean positive and negative predictive values indicate that MRI is a clinically reliable preoperative diagnostic modality.

A-0800 IS THERE RATIONALE FOR SCREENING FOR TRIGGER FINGER IN CARPAL TUNNEL SYNDROME PATIENTS? CLINICAL STUDY BASED ON OUR PREVIOUS META-ANALYSIS

Judit Reka Hetthessy[1,2], Luca Hergar[3,4], Barbara Sebok[5], Peter Sallai[6,7]
[1]Semmelweis University School of PhD Studies Workgroup for Science Management; [2]Hand Clinic, Budapest, Hungary; [3]Semmelweis University, Department of Orthopaedics; [4]Semmelweis University, Centre for Translational Medicine; [5]Dr. Manninger Jenő Trauma Centre Budapest; [6]St. Pantaleon Hospital, Dunaújváros, Hungary; [7]Saska-Med Bt, Hungary

Introduction: Patients with carpal tunnel syndrome (CTS) can represent more than 10% of patients at a hand clinic. Previous studies proved that trigger finger (TF) and CTS have similar risk factors, such as female sex, diabetes or hypothyroidism.
Aim: The aim of our study was to assess and quantify both symptomatic and subclinical TF occurrence in CTS patients.
Material & Methods: Prospective data collection was performed between October 2022 and September 2024 at two different hand clinics. Adult patients with CTS were included to the study. Patient characteristics, results of physical examination (Tinel-sign, Phalen-sign, presence of TF and Green's Grade classification) and electrophysiological findings were registered. Relationship between variables were assessed with Chi-square tests.
Results: 234 patients, 74 men and 160 women met the inclusion criteria. 174 of these patients (74,4%) were also diagnosed with TF, but only 80 of them (34,2%) had previous complaints. TF occurred most commonly on the middle finger (49,2%). 66,7% of all TF had Grade I severity. Female patients had 2,28 times higher chances of having TF compared to men (p=0,0047). Tinel-sign positivity equaled a 2,9 and 2,5-times higher chance of having TF on the right (p=0,0005) and left hand side (p=0,0042). Phalen-sign positivity was also associated with a higher odd of TF, OR was 1,65 for the right hand (p=0,098) and OR was 3,27 for the left hand (p=0,0002). The highest TF occurrence rate (88,2%) was observed at mild CTS severity.
Conclusions: TF was present in the majority of CTS patients, however more than half of these patients had subclinical presentation of the disease. Early diagnosis could contribute to more effective patient care through timely application of conservative treatment options or if necessary, surgical intervention.

A-0801 ADVANCING PATIENT-SPECIFIC DECISION-SUPPORT: INDIVIDUALIZED PREDICTION OF TREATMENT SUCCESS IN HAND AND WRIST CONDITIONS

Robbert M Wouters[1,2], Lisa Hoogendam[1,2], Yara E. van Kooij[1,2,3], Dominic Furniss[5], Joy C. MacDermid[6,7], Thomas J. Hoogeboom[8], Harm P. Slijper[1,2,4], The Hand-Wrist Study Group Ruud W. Selles[1,2]

[1]Department of Plastic, Reconstructive, and Hand Surgery, Erasmus MC, University Medical Center Rotterdam, Dr. Molewaterplein 40, Room EE-1589, PO Box 2040, 3000 CA, Rotterdam, The Netherlands; [2]Department of Rehabilitation Medicine, Erasmus MC, University Medical Center Rotterdam, Dr. Molewaterplein 40, Room EE-1589, PO Box 2040, 3000 CA, Rotterdam, The Netherlands; [3]Center for Hand Therapy, Xpert Hand Therapy, Flight Forum 130, 5657 DD, Eindhoven, The Netherlands; [4]Hand and Wrist Center, Xpert Clinics, Flight Forum 130, 5657 DD, Eindhoven, the Netherlands; [5]Nuffield Department of Orthopaedics, Rheumatology, and Musculoskeletal Sciences, University of Oxford, Oxford, United Kingdom; [6]School of Rehabilitation Science, McMaster University, Hamilton, Ontario, Canada; [7]Clinical Research Lab, Hand and Upper Limb Centre, St. Joseph's Health Centre, London, Ontario, Canada; [8]Radboud University Medical Center, IQ Health Science Department, Nijmegen, Netherlands

Introduction: Daily clinical decision-making is mostly based on treatment guidelines and clinician preferences, not always accounting for an individual's treatment goals and needs. Decisions can, therefore, be insufficiently individualized and are at risk of being suboptimal. We recently introduced the Personal Meaningful Gain (PMG), which represents the improvement an individual wants to obtain in a domain most important to that individual, given the baseline score. Hypothetically, an individualized and clinically relevant outcome measure such as the PMG would be valuable in an individualized decision-support model to facilitate shared decision-making and expectation management in hand and wrist care.

Aim: To create and evaluate a method for real-time prediction of effectiveness at the individual level based on the PMG in patients with common hand and wrist conditions (i.e., thumb carpometacarpal osteoarthritis, carpal tunnel syndrome, trigger finger, De Quervain's tenosynovitis, triangular fibrocartilage complex lesions, and Dupuytren's contracture).

Material & Methods: Based on end-user input throughout the process, we created and evaluated an individualized decision-support model that predicts the probability of obtaining the PMG in patients with common hand and wrist conditions. Data were collected as part of usual care at Xpert Clinics, a specialized clinic for hand and wrist care with 25 locations in the Netherlands. We included patients with complete baseline and follow-up data on the PMG (i.e., the goal at intake and whether that goal was obtained at three months follow-up). Using an 80/20 train/test split (n=5010/n=1253) and 10-fold cross-validation (5 repeats), we considered various logistic regression, neural networks, (extreme) gradient boosting machines, and random forest algorithms. We selected the best model based on discriminative ability (area under the curve) and calibration (calibration belts) in the test data set and the number of predictors after recursive feature elimination. All available baseline patient data were used as model input features, including sociodemographics, clinical characteristics, baseline patient-reported outcome measurement scores, mental health scores, and PMG baseline values (i.e., the domain chosen as most important and the baseline score and desired score on that domain).

Results: We selected a gradient boosting machine algorithm with thirteen predictors. This model had an area under the curve of 0.73 (95% confidence interval: 0.70 to 0.76, indicting acceptable to good discrimination) and excellent calibration in the test set. Following extensive end-user input, we built a user-centered shiny app that visualizes the predictions (https://veni-modellen.timformatie.nl/). The app visualizes the probability of reaching the PMG for different treatment options (i.e., hand therapy ± injection, injection, or surgery) based on the patient's specific profile and PMG domain and baseline and desired score on that domain.

Conclusions: We present a decision-support model that supports treatment decisions in hand and wrist care based on a patient-specific improvement goal in a self-chosen domain. The decision-support model can function as a conversation starter, facilitate expectation management, and aid shared decision-making in hand and wrist care. Using this tool can

improve data-supported, patient-centered, value-based healthcare. We are currently pilot-testing the decision-support model in daily practice.

A-0802 JOINT DENERVATION FOR THUMB CARPOMETACARPAL OSTEOARTHRITIS: A MULTICENTER STUDY ON REOPERATIONS AND LONG-TERM OUTCOMES

Niek J. Nieuwdorp[1,*], Camille Blaaker[1,*], Esmee Kwee[1], Ruud W. Selles[1,2], J. Michiel Zuidam[1], the Hand-Wrist Study Group, Caroline A. Hundepool[1,3]

[*]Contributed equally to this work; [1]Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands; [2]Department of Rehabilitation Medicine, Erasmus MC, Rotterdam, The Netherlands; [3]Hand and Wrist Center, Xpert Clinics, The Netherlands

Background: Joint denervation has emerged as a promising treatment for thumb carpometacarpal (CMC) osteoarthritis (OA), offering benefits such as minimal invasiveness and preservation of joint mobility. However, adoption of this technique has been limited due to the lack of large-scale studies and insufficient data on its long-term effectiveness.

Aim: This study aims to evaluate the long-term outcomes of joint denervation for thumb CMC OA and to identify prognostic factors of postoperative pain.

Material & Methods: This multicenter prospective study included patients with CMC OA who underwent joint denervation between March 2016 and November 2024. The primary outcome was the rate of reoperation for recurrent CMC joint complaints. Secondary outcomes included long-term pain, hand function, patient satisfaction, complication rates, and time to return to work. The Visual Analogue Scale (VAS, 0–100) for pain and function was recorded at baseline, 3 months, 12 months, and during long-term follow-up. A linear mixed model assessed VAS changes over time, while a joint model identified predictors of postoperative pain outcomes.

Results: A total of 69 patients (76 thumbs) were included. Extended denervation (including PIN/AIN) for CMC OA was performed in 30% of cases. After a median follow-up of 30 months (range: 6–110 months), 28% required revision surgery, with a median time to revision of 9 months. VAS pain during exertion improved significantly from 70 (95% CI: 64–75) at baseline to 50 (95% CI: 42–59) at 3 months ($p = 0.001$) and remained stable long-term among those not requiring revision. VAS function scores improved from 46 (95% CI: 39–53) to 60 (95% CI: 51–69) at 3 months ($p = 0.030$) and were sustained thereafter. Complications occurred in 8% of cases, and the median return to work was 3 weeks. At long-term follow-up, 66% of patients without revision said they would opt for the denervation again. Extended denervation resulted in 0.56 points less monthly improvement in pain scores compared to standard denervation ($p < 0.001$). Male patients experienced greater monthly pain reduction, improving 0.85 points more per month ($p = 0.023$)

Conclusions: Joint denervation is an effective treatment for CMC OA, offering rapid recovery and a low complication rate. Although 28% of thumbs required revision surgery, most patients experienced sustained improvements in pain and hand function during long-term follow-up. Because extended denervation requires an additional incision and does not lead to improved pain outcomes, we advise against its use in the treatment of CMC OA.

A-0803 DEVELOPING A PORCINE EX-VIVO LIVING LIMB SYSTEM TO STUDY THE 'HUMAN- ROBOTIC' INTERFACE: A NOVEL STRATEGY FOR BIONIC LIMB REPLACEMENT RESEARCH

Kavit Amin[1,2], John Stone[1], William Cowey[1], Corban Bowers[1], Miles Bolton[1], Emily Milburn[1], Georgie Chesworth[1], Tim Entwistle[1], Leen Jabban[5], Benjamin Metcalfe[5], Alex Casson[3], James Fildes[1,4]

[1]The Pebble Institute, Manchester, UK; [2]Division of Cell Matrix Biology & Regenerative Medicine, University of Manchester, UK; [3]Department of Electrical & Electronic Engineering, University of Manchester, UK; [4]Healthcare Technologies Institute, University of Birmingham, UK; [5]Centre for Bioengineering & Biomedical Technologies (CBio) University of Bath, UK

Introduction: Limbs play a vital role in how humans interact with our environment. Myoelectric prostheses (current state-of-the-art) operate using amplified muscle signals. They fall short in replicating the intricate functions of a native human hand, especially when muscle targets are weakened or absent.

Aim: Capture signals directly from the peripheral nervous system to control a bioprostheses. Our limited understanding and suitable models for the characterisation of these biological signals is a barrier to the bioengineering of state-of-the art robotic limbs replacements of the future.

Material & Methods: Porcine forelimbs (Landrace species) underwent ex-vivo normothermic perfusion (EVNP) for 24-hours. EVNP restores tissue metabolism outside of the body using a bespoke oxygenated, autologous blood-based medium, supported by the recirculation of substrates critical for health (perfusate).

Paired forelimbs were randomised to either EVNP or cold static storage (CSS). The proximal median nerve from each group received electrical stimulation (frequency 100.000mHz, Amplitude 1.000Vpp). Surface electrodes recorded muscle activity via Electromyography (EMG) and cuff electrodes were applied directly to the median nerve (ENG). Physiological parameters were recorded in real-time and optimised to mimic the in-vivo environment with limb perfusion confirmed using thermal imaging.

Results: Data supports the physiological preservation of porcine forelimbs for 24-hours. Recirculating perfusate haemodynamics and blood biochemistry remained within stable physiological parameters. Serial stimulation of the severed proximal median nerve generated detectable surface EMG signals and cuff neural signals (ENG). This was in keeping with our observations of elbow and radiocarpal flexion as early as thirty minutes following reperfusion, which can be observed for as long as twenty hours. No recordable electrical activity was observed in the control group

Conclusions: We identified demonstrable electrical activity within functional 'neuromuscular units' in a physiologically stable translatable model. This dataset shows peaks of excitation that are time dependent with evidence of decay with prolonged perfusion. Whilst we have confirmed efferent neural signals can be generated over a prolonged period, stimulation parameters warrant further investigation to avoid nerve injury. This dataset requires comparisons with in-vivo data as well as more sophisticated methods of electrophysiological nerve testing.

The primary innovation of our research platform is the models' alignment with the 3Rs approach towards the use of animals for research purposes. The current most advanced prostheses that are not widely available are reliant upon EMG signals. They are critiqued for their spontaneous, unwanted movements, a consequence of poor signal detection secondary to muscle fatigue and electrical interference.

Direct neural stimulation in humans has been criticised for its untoward perceptions, evoking paraesthesia-like sensations. The future success of robotic limb replacements will be reliant upon signals generated from the peripheral or central nervous system and coordinated by specialised electrodes. They must be biocompatible, selective, able to process large amounts of information and powered by some means. Practical models for the accurate testing of electrodes are almost non-existent. We have demonstrated this model enables the safe study of interface technology that is affordable, high-throughput, and ethical whilst avoiding the inadvertent risks of acute nerve injury.

A-0804 TWO-STAGE FLEXOR TENDON RECONSTRUCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

Niek J. Nieuwdorp, Anika A. Castel, L. S. Samantha Cheng, Floris W. van de Kamp, Daan Stam, Caroline A. Hundepool, J. Michiel Zuidam

Department of Plastic, Reconstructive and Hand Surgery, Erasmus MC, Rotterdam, The Netherlands

Background: Primary repair is the preferred treatment for flexor tendon injuries. However, in cases of delayed presentation, missed injuries, or failed primary repairs, it may not be feasible. In such scenarios, two-stage flexor tendon reconstruction remains a salvage option, especially when scarring, joint contractures, or pulley damage is present. Despite its established role, reported outcomes vary widely. There is ongoing debate regarding the optimal timing of both the initial surgery and the interval between the two stages. Additionally, the effect of graft type on postoperative function remains unclear. While intrasynovial grafts are believed to promote better tendon gliding and reduce adhesion formation, extrasynovial grafts such as the palmaris longus are more readily available and commonly used in practice.

Aim: This systematic review and meta-analysis evaluates the functional outcomes of two-stage flexor tendon reconstruction and explores whether surgical timing and graft choice influence postoperative outcomes.

Material & Methods: A systematic literature search in Embase, MEDLINE, and Web of Science was performed up to May 2025. The search targeted clinical studies reporting functional outcomes, surgical timing, and graft types used for two-stage flexor tendon reconstruction in the hand. Meta-analyses were performed to estimate the pooled proportion of normal total active motion (TAM) restored and the percentage of patients achieving good to excellent outcomes, based on Strickland or Buck-Gramcko scales. Meta-regression was used to assess the relationship between graft type, surgical timing, and TAM.

Results: From 2,084 articles identified, 33 studies involving 995 patients and 1,139 affected digits met the inclusion criteria. On average, two-stage flexor tendon reconstruction restored 73% of normal TAM (95% confidence interval [CI]: 68%–79%) and resulted in good to excellent outcomes in 67% of patients (95% CI: 57%–75%). Meta-regression analysis showed no significant relationship between TAM and the time from injury to Stage I surgery ($p = 0.197$), the interval between the two surgical stages ($p = 0.321$), or the type of tendon graft used ($p = 0.656$)

Conclusions: Two-stage flexor tendon reconstruction restores approximately 74% of normal finger motion and achieves good to excellent outcomes in about two-thirds of patients. No evidence was found that delays between injury and Stage I surgery negatively impact functional outcomes. In the absence of evidence guiding timing or graft selection, these decisions should rely on the surgeon's clinical judgment and experience.

A-0805 3D ANALYSIS OF THE THUMB AFTER TRAPEZIOMETACARPAL FUSION

Isabelle Schellenberg[1], Gabriella Fischer[2], Maurizio Calcagni (2, 3), Lisa Reissner[1]

[1]Balgrist University Hospital Zurich, Switzerland; [2]University Hospital Zurich, Switzerland; [3]Hand Institute Zurich, Switzerland

Introduction: Osteoarthritis of the carpometacarpal (CMC) joint can effectively be treated surgically with first metacarpal osteotomy (Wilson), trapeziectomy with ligament reconstruction and tendon interposition (LRTI), implant arthroplasty or CMC I fusion.

Aim: The aim of the study was to evaluate patients after trapeziometacarpal (TMC) fusion with 3D motion analysis and compare it to previously measured surgical treatments of CMC I osteoarthritis.

Material & Methods: Six patients (age 52 years, range 39-63 years) with seven TMC fusion because of osteoarthritis were recorded after a median follow up of 4.3 years (range 2-10 years) with a 3D motion capture system during the performance

of four thumb movements: abduction/adduction; extension/flexion, opposition and circumduction. The thumb range of motion (ROM) and axis were calculated for each trial. The kinematics of the thumb were compared to previous results after Wilson osteotomy (WO, n=10), ligament reconstruction and tendon interposition (LRTI, n=10) and joint arthroplasty (Touch, n=9). Subjectively the patients were evaluated using the Michigan Hand Questionnaire (MHQ). Radiographs of the thumb were taken preoperatively and at the follow-up time point to investigate the presence or absence of osteoarthritis.
Results: Motion of the CMC I joint in patients after TMC I fusion was as expected significantly reduced compared to patients after WO, LRTI or Touch. ROM in the metacarpophalangeal (MP) joint was significantly higher in the TMC I fusion group. Median MHQ score was 89 (range 63-100) and showed no statistically difference to patients after WO, LRIT or Touch. Osteoarthritis developed in five scaphotrapeziotrapezoid joints and in three MP joints. Only two patients did not develop degenerative joint changes in the adjacent joints.
Conclusions: Despite the fusion of the TMC joint, the patients have the good circumduction and opposition of the thumb due to the compensation in the MP joint. Although they develop osteoarthritis in the adjacent joints, they are satisfied with the function of their hand.

A-0806 USE OF A CUSTOMIZED IMPLANT IN THE MALUNION OF A BASE FRACTURE OF THE THUMB: A CASE REPORT

Ester Junyent Vilanova, Laia Berta Compte, David Gutierrez Medina, Carlos Tatá Rojas, Daniel Arribas Agüera
Fundació Salut Empordà Figueres (Girona), Spain

Introduction: The primary application for 3D printing are the production of anatomical models for planning and surgery simulation, patient-specific instruments and custom-made prosthesis which have transformed how orthopedics problems are addressed now.
Aim: To use a customized implant for the treatment of a malunion of a base fracture of the thumb in a young patient and evaluate functional and radiological outcomes.
Material & Methods: We present the case of a 45-year-old patient with no relevant medical history,who sustained a fracture of the base of the thumb on the dominant hand, initially treated conservatively at another center. The patient reported significant functional limitation in daily activities, presenting with thumb adduction and hyperextension of the metacarpophalangeal joint. X-rays revealed shortening of the first metacarpal. A 3D CT scan was performed,showing a fracture malunion with 90º angulation without articular surface involvement.
The patient underwent surgery via dorsal approach. A corrective osteotomy was performed using a customized cutting guide (Koobo Implants), designed with the assistance of a CT scan contralateral hand, which allowed for deformity quantification and osteotomy planning. Fixation was achieved with a custom-made titanium plate and autologous corticocancellous graft from the iliac crest under fluoroscopic guidance. Postoperatively, the joint was immobilized with a forearm cast for one month, followed by rehabilitation.
Results: The patient experienced good progress with improved range of motion,achieving full extension and 70º abduction. However, a deficit in metacarpophalangeal flexion required new surgery with good results. The patient reported no pain (VAS 0) and significant improvement in functional limitations for daily and occupational activities. Radiological follow-ups showed satisfactory results, with good graft integration and 100% consolidation on a CT scan performed a year post-surgery.
Conclusions: Managing base fractures of the thumb that are initially mismanaged in young patients is challenging. Malunions can lead to pain and significant limitations. These types of fractures are complex for surgeons, and osteotomy templates and customized implants can be a viable therapeutic option. Although no studies currently demonstrate superior

postoperative outcomes using customized guides for corrective of phalanges and metacarpals, their use facilitates bettes surgical planning and reduces operative time in complex cases such as this

A-0807 RESULTS AND COMPLICATION RATE OF LONG FLEXOR TENDON REPAIR IN THE FINGER: MODIFIED KESSLER VS. M-TANG SIX-STRAND TECHNIQUE

Grigorios Kastanis[1,2], Mikela-Rafaela Siligardou[2], Konstantinos Zampetakis[2], Constantinos Chaniotakis[2], Alexandros Tsioupros[2], Anna Pantouvaki[1,3], Petros Kapsetakis[1]

[1]Reconstructive Hand Surgery Unit, General Hospital of Heraklion –Venizeleio, Crete, Greece; [2]Department of Orthopaedic, General Hospital of Heraklion-Venizeleio, Crete, Greece; [3]Department of Physiotherapy, General Hospital of Heraklion-Venizeleio, Crete, Greece

Introduction: There are several flexor tendon repair techniques for the hand in Zone II, and this is observed because primary repair presents a challenge for orthopedic hand surgeons. A consensus on the best technique has not yet been reached.
Aim: The aim of this study is to compare the functional outcomes following flexor tendon repairs in zone II using two different techniques: Modified Kessler technique and M- Tang six-strand technique.
Material & Methods: Ninety-nine patients with a laceration of the flexor digitorum profundus tendon in Zone II (Verdan classification) of the hand were included in this study, conducted between January 2019 and December 2022. All the patients underwent primary tendon repair, using Wide- Awake Local Anesthesia No Tourniquet (WALANT) technique and followed a 1-year follow-up. The patients were divided into two groups based on the repair technique. The modified Kessler technique was used in forty-seven cases (Group A), while the M-Tang six-strand technique was used in fifty-two cases (Group B). The average age of all patients was 36.4 years and most of the injuries occurred during work. The ring finger was the most commonly injured finger (28 patients). In both techniques, a 4.0 non-absorbable suture was used for the axial sutures, followed by an epitendinous suture with 6.0. Visual Analogue Scale (VAS) score, Strickland's evaluation system and the Quick Disabilities of the Arm, Shoulder & Hand (DASH) score were used to evaluate the clinical outcomes of patients postoperatively. The rehabilitation program was the same for both groups postoperatively, including early movement (both active and passive finger mobilization).
Results: In group A, the average VAS score was 12/100. Total active movement (TAM), according to Strickland's evaluation system, was excellent in 31 patients, good in 11 patients and fair in 5 patients. The average Quick DASH score was 18.4. In group B, the average VAS score was 10/100. TAM was excellent in 39 patients, good in 9 patients and fair in 4 patients. The average Quick DASH score was 14.6. All the above indices refer to the final follow-up. Two patients from Group A developed postoperative wound infection, which was successfully treated conservatively with oral antibiotic therapy for 2 weeks. Suture failure and re-rupture occurred in 7 patients from Group A and in 3 patients from Group B, followed by re-suturing using the same technique for each group, without further complications.
Conclusions: Both techniques have a place in primary flexor tendon repair (Zone II), with the M-Tang six- strand suture technique yielding better functional outcomes and a lower complication rate.

A-0808 INSTANT POST-OPERATIVE RETURN OF TIP-TIP PINCH STRENGTH DIRECTLY AFTER LACERTUS RELEASE

Ileen Domela Nieuwenhuis[1,2], SB Paulusma[1], NWL Schep[1], JH Coert[2], JB Jaquet[1]
[1]Maasstad Hospital, Rotterdam, The Netherlands; [2]University Medical Center Utrecht, Utrecht, The Netherlands

Introduction: Tip-tip pinch weakness is typical for proximal median nerve compression (PMNC) and may assist in differentiating PMNC from carpal tunnel syndrome (CTS). The muscles responsible for tip-tip pinch—flexor pollicis longus (FPL) and flexor digitorum profundus of the index finger (FDP2)—are innervated by the anterior interosseous nerve, a branch of the median nerve in the forearm that remains unaffected in CTS. Proximal median nerve decompression positively influences the anterior interosseous nerve and its motor signals, potentially resulting in an immediate restoration of strength.
Aim: To evaluate immediate and long-term changes in tip-tip pinch strength following lacertus release (LR) and carpal tunnel release (CTR), enabling a comparison of the effects of proximal and distal median nerve decompressions.
Material & Methods: Patients scheduled for median nerve decompression under local anesthesia were included. Participants were divided into three groups based on the surgical procedure performed: LR (n=20), CTR (n=20), or combined LR and CTR (n=20). Tip-tip pinch strength was measured preoperatively, at 5 minutes postoperatively, after two weeks, and at three months. Each measurement was repeated three times for accuracy.
Results: Sixty patients (18 males) with an average age of 55 years (range: 18–83 years) were included. Immediately postoperatively, the LR group showed a median strength gain of +57% (interquartile range; IQR: +30% to +90%). Patients undergoing combined LR and CTR experienced a median improvement of +32% (IQR: -15% to +60%), while the CTR-only group exhibited a median strength change of -10% (range: -25% to -1%), likely due to postoperative discomforts, such as stitch-related concerns or pain. No significant changes in tip-tip pinch strength were observed at the two-week follow-up. However, at three months, strength gains were significant across all groups compared to baseline: LR patients (+55%, IQR: +30% to +85%), LR and CTR patients (+41%, IQR: +6% to +65%), and CTR patients (+5%, IQR: 0% to +24%).
Conclusion: The immediate return of tip-tip pinch strength following proximal median nerve decompression highlights its potential value as a real-time diagnostic tool for lacertus syndrome in the perioperative setting.

A-0809 MULTIPLE PULLEY INJURIES AFTER CORTICOSTEROID INFILTRATIONS FOR TRIGGER FINGER: CASE REPORT

Romeo Raimondo Ribolzi, Emanuele Pamelin
UOC Chirurgia della Mano, Ospedale San Giuseppe, Multimedica, Milano, Italy

Introduction: we present a case of degenerative A1 to A4 pulley injury of the 3rd finger of the right hand about 3 months after 2 corticosteroid injections for tenosynovitis of the 3rd finger flexors in a 23-year-old patient without major trauma.
Aim: to present a very rare but catastrophic complication of corticoid injection for trigger finger
Material & Methods: The patient came to our attention for flexion deficit of the PIP and MP joints of the 3rd finger of the right hand for about 6 months, with stiffness of the IFP and evident bowstringing at the proximal and middle phalanx. On surgical exploration, flexor tendon integrity was found with degenerative lesion of the A1, A2, A3, A4 pulleys with a gap of about 1 cm between the flexor tendons and P1 and about 0.5 cm between the flexor tendons and P2, filled by fibrous tissue.
Removal of the fibrous tissue, repositioning of the flexor tendons and reconstruction of the A2 and A4 pulleys restored the biomechanics of the flexor apparatus.
Results: we obtained full range of motion after 2 months

Conclusions: Only three cases of pulley injury resulting from corticosteroid infiltration are described in the literature: this rare but dreaded complication should warn us and limit the infiltrative therapy for trigger finger.

A-0810 THE ROLE OF THE WRIST WIDGET IN THE SYMPTOMATIC TREATMENT OF LONG ABDUCTOR AND SHORT EXTENSOR THUMB INSTABILITY AFTER TENOLYSIS OF THE FIRST DORSAL COMPARTMENT

Emanuele Pamelin
Romeo Raimondo Ribolzi
UOC Chirurgia della mano, Ospedale San Giuseppe, Multimedica, Milano

Introduction: Among the most frequent complications after surgical treatment for M. de Quervain's disease are tendon and nerve injuries, and instability of the tendons of the first compartment. Instability of the long abductor and short extensor of the thumb can be a disabling complication and require revision surgery and stabilisation or reconstruction of the first compartment.
Aim: We present our experience with the use of the wrist widget, commonly used in the symptomatic treatment of ulnar wrist pain, in the treatment of this complication.
Material & Methods: Two patients who came to our attention for first extensor compartment instability after tenolysis refused revision surgical treatment and were treated conservatively with wrist widgets, worn rotated 180° from traditional use for ulnar wrist pain and EUC instability.
Results: The use of the brace allows extrinsic stabilisation of the tendons of the first compartment allowing subjective improvement of instability and pain in both patients.
Conclusions: Our experience may open new frontiers in the symptomatic treatment of this frequent complication after surgery for M. de Quervain's disease.

A-0811 EVALUATING THE FUNCTION OF THE LITTLE FINGER FLEXOR DIGITORUM SUPERFICIALIS ON MUSICAL PERFORMANCE IN PROFESSIONAL MUSICIANS

Haoyang Chen[1], Siddarth Venkateswaran[1], Haoxing Lai[1], Shuxiang Yang[2], Brett Stemple[2], Zi Qiang Glen Liau[3]
[1]Yong Loo Lin School of Medicine, Singapore; [2]Yong Siew Toh Conservatory of Music, Singapore; [3]National University Hospital, Singapore

Introduction: The absence of the flexor digitorum superficialis (FDS) of the little finger is widely reported. Independent flexion of the proximal interphalangeal joint (PIPJ) of the little finger may thus be absent compared to individuals with independent FDS-5 function.
Musicians require accurate, precise and dexterous movements, which means that the smallest movement of the little finger may have great implications on musical performance at a professional level.
Aim: We aim to investigate whether the lack of independent flexion of the little finger PIPJ in absent FDS function affects the musical ability of professional musicians.
Material & Methods: 25 Bachelor of Music students (11 male, mean age (years) 23.4 [8.7]) were recruited from Yong Siew Toh Conservatory of Music, National University of Singapore. The cohort was divided into 21 strings and 10 piano players. Independent or absent FDS function of the little finger was assessed using the standard and modified tests. All participants were asked to perform a grip strength test and a dynamic test. The dynamic test required participants to play a little

finger focused musical trill piece, 2 independent professional musicians then judged the number of trills performed in 10 seconds, and scored the regularity and coordination out of 10.
Results: Crude prevalence of absent FDS function is 36.0% (9/25), bilateral prevalence is 16.0% (4/25), true prevalence is 26.0% (13/50).
Absent right hand FDS function was associated with significantly better piano performance compared to independent FDS function, including more trills in 10 seconds (41.0 [4.4] vs 32.9 [4.8], p=0.036), higher regularity score (7.3 [1.6] vs 4.6 [1.6], p=0.042), and higher coordination score (7.0 [1.7] vs 3.9 [1.6], p=0.023).
For string players, male players had stronger right hand grip strength (kg) (31.7 [6.3] vs 21.5 [4.5], p<0.001], stronger left hand grip strength (28.7 [7.3] vs 20.9 [6.4], p=0.025), and performed more trills in 10 seconds (32.9 [7.2] vs 23.9 [7.7], p=0.013).
For piano players, female players performed significantly better for both hands compared to male players. They had a higher right hand regularity score (7.9 [6.6-8.3] vs 4.5 [3.0-4.8], p=0.0016), higher right hand coordination score (6.9 [1.4] vs 3.4 [1.0], p=0.0017), higher left hand regularity score (7.6 [6.8-7.8] vs 4.1 [3.5-5.0], p=0.014), and higher left hand coordination score (6.9 [1.2] vs 3.5 [1.8], p<0.001)
Conclusions: The unexpected finding regarding absent right hand FDS function and improved performance ability could indicate that there may be adaptive techniques or compensatory mechanisms at work. Other factors, such as gender could play a more significant role in the musicians' ability to perform, possibly suggesting that gender-specific musical pieces might be beneficial in optimizing performance.

A-0812 SEQUENTIAL CADAVERIC SECTIONING AND SCAPHOLUNATE INSTABILITY

Joshua Andrews[1], Melanie Amarasooriya[2], Simon Bellringer[3], Gregory Bain[4]
[1]Flinders Medical Student, Flinders University, Australia; [2]PHD Candidate, Flinders University, Orthopaedic Surgeon, Sri Lanka; [3]Clinical Fellow, Flinders Medical Centre, Orthopaedic and Trauma Surgeon, United Kingdom; [4]Professor of Upper Limb Surgery, Orthopaedic Surgeon, Flinders University, Australia

Introduction: Scapholunate instability (SLI) is the most common form of carpal instability. Without accurate diagnostic and surgical techniques, arthritic changes will frequently occur. Surgical outcomes for SLI remain suboptimal, in-part due to a limited consensus on the role each ligament plays towards supporting the complex. This systematic review assesses cadaveric sectioning to evaluate the role of each ligament, and how instability patterns are created.
Aim: The aim of this systematic review was to review the cadaveric serial sectioning studies, to better understand the role each ligament plays in scapholunate instability, and how these findings might be applied to clinical practice.
Material & Methods: PRISMA methodology identified 29 studies which met the eligibility criteria, including 376 cadaveric specimens. The key outcome measures were scapholunate gap (SLG), scapholunate angle (SLA), radiolunate angle (RLA) and dorsal intercalated segment instability (DISI).
Results: Sectioning of the Scapholunate ligament (SLIL) alone revealed a mean increase in SLG +2.0mm, SLA +8.8° and RLA +1.8° but DISI was not produced. Sectioning any other ligaments with the SLIL intact did not produce instability. Following SLIL sectioning, additional sectioning of the dorsal intercarpal ligament (DIC) produced the greatest increase in SLG, SLA and RLA. Additional sectioning of the STT, RSC and LRL increased outcome measures, but to a lesser extent than the DIC. The clenched-fist position created a large increase in SLG and SLA when the SLIL was sectioned. DISI was only observed with sectioning of the SLIL and a secondary stabiliser but was not a consistent finding.
Conclusions: This review confirms that the SLIL is the primary stabiliser of the scapholunate joint. The DIC is the dominant

secondary stabiliser, while the STT, RSC, LRL and DRC hold a lesser, yet important role. DISI requires significant ligament injury, and likely includes damage to the SLIL, DIC, STT and DRC.
Clinical relevance: If an injured wrist presents with normal radiographic measurements, the SLIL is unlikely to be injured, and the SL joint will be stable. We suggest enhanced diagnostic evaluation including a dynamic component, and when surgically indicated, repair of the primary and secondary restraints.

A-0813 CLINICAL, RADIOLOGICAL AND ARTHROSCOPIC FEATURES OF DORSO-ULNAR TEARS OF THE TFCC

Nicholas C Smith[1,2], Philippe Massard-Combe[1]
[1]Specialty Orthopaedics Upper Limb Surgery, Sydney, Australia; [2]Macquarie University Hand Unit, Sydney, Australia

Introduction: The understanding of the anatomy and function of the TFCC is continues to evolve, with significant contributions from Palmer in 1989 and Atzei in 2011, who played pivotal roles in classifying TFCC lesions. Despite these advancements, dorsal-ulnar TFCC lesions remain underexplored, with limited studies addressing this subset. This study aim to present our experience with dorsal-ulnar TFCC lesions and provide a comprehensive analysis of their clinical presentation, imaging findings and arthroscopic characteristics.
Aim: To characterise the clinical and radiographic presentation of arthroscopically proven dorso-ulnar TFCC tears
Material & Methods: In this retrospective study conducted across two different hospitals, all adult patients who underwent arthroscopically-assisted repair of dorsal TFCC tears by the same senior surgeon were included. Clinical, radiological and arthroscopic features were then analyzed retrospectively. Patients with a history of prior TFCC surgery were excluded from the study.
Results: A total of 185 patients underwent wrist arthroscopy for ulnar-sided pain between February 2022 and August 2024. Of these, we included 44 wrists from 42 adult patients who sustained dorsal TFCC tears repaired with arthroscopic assistance. The mean age at the time of surgery was 34.1 years (SD 11.7). The dominant hand was affected in 70% of the cases. All patients reported ulnar-sided pain during prono-supination and 86% presented with volar DRUJ laxity. MRI reports accurately identified dorsal TFCC tears in 14% of cases. In 48% of cases, the MRI findings falsely reported no abnormalities in the TFCC. Arthroscopy revealed synovitis in 100% of cases, in addition to the dorsal tear. While foveal hook test was negative in all of the patients, the dorsal hook test was positive in every case, serving as a consistent diagnostic feature. Associated SL instability (EWAS 3B, 3C or 4) was observed in 55% of patients. The tear was repaired using 2/0 PDS sutures, with two stitches used in 39% of cases, three stitches in 27%, and the number of stitches not specified in 34% of cases.
Conclusions: Dorsal (or dorso-ulnar) TFCC tears predominantly affect young patients and commonly present with persistent ulnar-sided wrist pain. Although their range of motion is typically preserved, the majority of patients demonstrate volar DRUJ laxity during physical examination. These tears are often undiagnosed as MRI reports frequently fail to identify them and they may be obscured during arthroscopy by overlying synovitis. Dorsal TFCC tears are often associated with SL instability; therefore, a thorough midcarpal evaluation is highly recommended.

A-0814 LONG-TERM OUTCOMES OVER 15 YEARS AFTER JUDET-TYPE RADIAL HEAD REPLACEMENT FOR RADIAL HEAD AND NECK FRACTURES

Hideaki Ishii, Shu Yoshizawa, Takahiro Maeda, Misato Sakamoto, Kayo Yamada, Homma Tomoyasu, Osahiko Tsuji, Hiroyasu Ikegami

Department of Orthopaedic Surgery (Ohashi), School of Medicine, Toho University, Tokyo, Japan

Introduction: Radial head fractures are common injuries, occurring mostly in active young people. The treatment of complex radial head fractures appears to be challenging. Radial head replacement with a metal prosthesis has been considered as the treatment of choice. However, long-term results are not well reported. We reviewed the postoperative outcomes of 8 cases of radial head and neck fractures treated with the Judet CRF bipolar radial head prosthesis in which long-term follow-up was possible.

Material & Methods: Seventeen patients with radial neck fractures who had difficulty with firm internal fixation or who were disabled after surgery at another hospital between 1998 and 2008 were included in this study. Of these, eight cases with more than 15 years of postoperative follow-up were evaluated for implant loosening, heterotopic ossification, and degenerative changes around the elbow joint on radiographs. Range of motion of the elbow at the last visit and other complications were also evaluated.

Results: There were 5 males, 3 females, 5 right, 3 left, 5 dominant, 3 non-dominant, 4 initial and 4 revision surgeries, and the mean age at surgery was 41.8 (26-55) years. Mean follow-up was 19.8 (15-25) years. Complicated injuries at the time of trauma included 4 dislocations, 3 medial collateral ligament injuries, 3 ulnar fractures, and 1 metaphyseal injury. Plain radiographs at follow-up showed a radiolucent line of more than 2 mm around the artificial radial head stem in 2 cases and heterotopic ossification with functional impairment in 4 cases. Only one case required additional surgery after artificial radial head replacement at our institution, and there were no cases of elbow instability or dislocation due to implant loosening

Conclusions: Long-term results of the Judet CRF bipolar radial head replacement for radial head neck fractures are generally good. In most cases, there is no implant loosening, which can be problematic on plain radiographs. On the other hand, some patients had limited range of motion that interfered with their daily activities. The common denominator in these patients was a concomitant elbow dislocation at the time of injury and postoperative heterotopic ossification. When placing implants, we are careful not to over-lengthen the radius relative to the length of the ulna. We also believe that any concomitant injuries, such as ligament injuries, must be reconstructed during surgery to achieve elbow stability and favorable clinical results.

A-0815 IMPROVING MEASUREMENT ACCURACY OF PRONATION/ SUPINATION USING INERTIAL MEASUREMENT UNITS

Michael Wirth[1], Gabriella Fischer[1], Maurizio Calcagni[1,2]

[1]Department of Plastic Surgery and Hand Surgery, University Hospital Zurich, Zurich, Switzerland; [2]Hand Institut Zurich, Zurich, Switzerland

Introduction: Pronation and Supination in the forearm occur during rotation of the radius over the fixed ulna in the proximal and distal radioulnar joint. The assessment of Pronation/ Supination range of motion (ROM) is difficult with a goniometer, so often it is simply estimated in clinical practice. Exact measurement is possible with an optoelectronic motion capture system (OMC) but due to its complex and time-consuming use, no clinical application is possible.

Inertial measurement units (IMU) are accurate in flexion/ extension and radial/ ulnar deviation assessment and suitable for clinical use. We now tested a modified setup for Pronation/ Supination.

Aim: Improve Measurement Accuracy in Pronation/ Supination using inertial measurement units to better objectify surgical outcomes.
Material & Methods: Ten subjects with healthy right dominant hands were included and equipped with skin marker clusters for the OMC and with IMU sensors on hand and lateral epicondyle. IMU sensors were also equipped with OMC markers for direct comparison.
Maximum ROM of five different trials and mean absolute difference between the two systems and between IMU and markers on the IMU sensors were calculated.
The kinematic evaluation of the OMC was calculated according to an established protocol. The evaluation of the IMU was done by the manufacturer's software.
Results: The mean absolute difference of the ROM between the IMU and the OMC was 13 ° ± 8° and 7 ° ± 5 ° between IMU and OMC markers directly on the IMU sensors.
The mean pronation/ supination ROM amounts to 145° when measured with the IMU, 157 ° with the OMC and 141° with OMC markers on the IMU sensors
Conclusions: The observed differences between the IMU and the OMC show a systematic ROM underestimation by the IMU in the tested setup but high agreement between IMU and OMC markers on the IMU sensors, possibly due to skin movement over the lateral epicondyle during Pronation/ Supination. This hints to the need for an even more proximal sensor positioning. The study still shows the potential of IMU in measuring the complex Pronation/ Supination movement with high agreement between its results and the OMC markers directly on the sensors.

A-0816 TOTAL JOINT REPLACEMENT FOR OSTEOARTHRITIS OF THE CARPOMETACARPAL JOINT OF THE THUMB: FUNCTIONAL OUTCOMES AND COMPLICATIONS

Mikela-Rafaela Siligardou[2], Grigorios Kastanis[1,2], Konstantinos Zampetakis[2], Constantinos Chaniotakis[2], Alexandros Tsioupros[2], Petros Kapsetakis[2], Ioannis M. Stavrakakis[2], Anna Pantouvaki[1,3]
[1]Reconstructive Hand Surgery Unit, General Hospital of Heraklion –Venizeleio, Crete, Greece; [2]Department of Orthopaedic, General Hospital of Heraklion-Venizeleio, Crete, Greece; [3]Department of Physiotherapy, General Hospital of Heraklion-Venizeleio, Crete, Greece

Introduction: Osteoarthritis of the trapeziometacarpal (TMC) joint is a chronic condition that affects many patients. When conservative treatment for this condition fails and patients suffer from persistent pain, surgical intervention is recommended. Many surgical treatments has been recommended with varying functional results.
Aim: The aim of our study is to present the functional outcomes of Touch® Double Mobility Arthroplasty in patients with osteoarthritis of the TMC joint who have failed conservative treatment.
Material & Methods: In total, twenty-four patients with osteoarthritis of the TMC joint underwent Touch® Double Mobility Arthroplasty of the TMC joint between January 2018 and October 2023 and followed up for one year. Of these patients, 6 were men and 18 were women, with an average age of 64.5 years. The stage of osteoarthritis was recorded for all patients using the Eaton-Littler Classification. Based on this classification, 8 patients were stage II, 12 patients were stage III, and 4 patients were stage IV. The dominant hand was involved in 12 patients. A history of rheumatoid arthritis was recorded in 6 patients. All surgeries were performed using the Wide- Awake Local Anesthesia No Tourniquet (WALANT) technique. Patient Satisfaction Questionnaire Short Form (PSQ-18), Visual Analogue Scale (VAS) score, Quick Disabilities of the Arm, Shoulder & Hand (DASH) score, Kapandji index and key- pinch strength score were used to evaluate the clinical outcomes of patients postoperatively. All patients had immobilization of the thumb in a brace for a total of one month postoperatively, followed by the same rehabilitation program.

Results: At the end of one year of follow- up, the average VAS score was 8/100, the average Quick DASH score was 9.1, the average Kapandji index was 9.6 and the average key- pin strength score was 5.7. All the parameters that were studied showed significant postoperative improvement compared to preoperative values. Additionally, the average PSQ- 18 score was 83.9. Intraoperatively, the only complication that occurred in one patient was an intraoperative fracture of the trapezium. Three months postoperatively, 6 patients developed De Quervain's disease, which was treated conservatively with local corticosteroid injections.
Conclusions: Touch® Double Mobility Arthroplasty of the TMC joint offers many advantages, such as restoration of length, thumb alignment, rapid functional recovery with minimal complications. Based on our results, this technique is a safe and effective method for the treatment of osteoarthritis of the TMC joint.

A-0817 FUNCTIONAL RESULTS OF FOREARM PRONATION OSTEOTOMY SURGERY IN CHILDREN WITH TOTAL CONGENITAL BRACHIAL PLEXUS INJURY

Yigit Aras Yigit[1], Akın Üzümcügil[2], Kıvanç Delioglu[3]
[1]Hakkari Semdinli State Hospital, Hakkari, Turkey; [2]Department of Orthopaedics and Traumatology Hacettepe University Hospital, Ankara, Turkey; [3]Faculty of Physical Therapy and Rehabilitation Hacettepe University, Ankara, Turkey

Introduction: Supination contractures, which occur as a result of the power imbalance between the pronator and supinator muscle groups along with flaccid paralysis in children with total plexus damage, are important reasons for the limitations in hand use of patients in daily life. During the follow-up period after birth, problems such as retraction of the interosseous membrane, subluxation of the distal radioulnar joint and radial head dislocation can be observed. Biceps redirection, interosseous membrane release or derotation osteotomy surgeries are performed for pronation deficiency. The main goal of these surgeries is to restore assistive hand function to the affected hand.
Aim: The first aim of our study is to investigate the changes in active/passive range of motion, forearm rotation posture at rest, Active Movement Scale (AMS) scores, Modified Mallet Scale forearm position at rest, Raimondi Hand Scale results and Brachial Plexus Outcome Measure (BPOM) scores after osteotomy surgery for pronation gain and structured targeted physiotherapy programme. The second aim of our study is to compare the only radius and combined (radius and ulna) derotation surgery groups with all parameters in forearm derotation osteotomies.
Material & Methods: This study is a retrospective analysis of the results of forearm derotation osteotomy for forearm supination contracture in 37 children aged 5-18 years with total plexus damage, who were followed up with a diagnosis of congenital brachial plexus injury in the Department of Orthopedics and Traumatology, Hacettepe University Hospital, between 2018 and 2023. Patients were divided into two according to osteotomy techniques: only radius derotation(24 patients) and combined derotation(13 patients).
Results: When joint movements were analyzed; an increase of 45º[(40º)-(47.5)º] in passive pronation, a decrease of 20º[(15º)-(25º)] in passive supination, an increase of 10º[(5º)-(15º)] in active pronation, and a decrease of 10º[(5º)-(15º)] in active supination were observed($p<0.001$). A change of 45º[35º-60º] in the direction of pronation was detected in the forearm rotation posture at rest($p<0.001$). The pronation score according to AMS increased from 1.0[(0.0)-(2.0)] before surgery to 2.0[(1.0)-(3.0)] after surgery($p<0.001$). Raimondi Hand Scale scores increased from 2.0[(1.5)-(3.0)] before surgery to 3.0[(2.0)-(4.0)] after surgery($p<0.001$). According to the Modified Mallet Scale, it was determined that 48.6% of the patients could be turned to the pronation direction and there was an increase in BPOM scores in the activity area ($p<0.001$). All evaluations were also compared in terms of surgical groups. Passive wrist extension, active elbow flexion and AMS supination scores were higher in the combined derotation group compared to the only radius

derotation group($p<0.01$). In addition,no difference was observed between the groups in all other parameters($p>0.05$). Conclusions: As a result of this study,an increase in pronation movement and activity levels of the affected upper extremity were observed after both derotation osteotomies. It is aimed to use the affected hand as an "assisting hand" in children with total plexus damage, and this level is determined as 3 on the Raimondi Hand Scale. It has been determined that the "assisting hand" function can be achieved with both surgical options and the subsequent structured goal-oriented physiotherapy process.

A-0818 THE EFFECT OF HYSTERESIS ON WRIST KINEMATICS IN HEALTHY AND SCAPHOLUNATE LIGAMENT-INJURED WRISTS USING DYNAMIC CT

Hanne S Vries[1,3], M Haenen[1,3,4], EHS Teule[1,2], S Hummelink[1], I Sechopoulos[3], EPA van der Heijden[1,4]

[1]Department of Plastic Surgery, Radboudumc, Nijmegen, the Netherlands; [2]Orthopaedic Research Lab, Radboudumc, Nijmegen, The Netherlands; [3]Department of Radiology, Radboudumc, Nijmegen, The Netherlands; [4]Department of Plastic Surgery, Jeroen Bosch Hospital, 's-Hertogenbosch, The Netherlands

Introduction: Four-dimensional computed tomography (CT) wrist imaging is an innovative modality that enables non-invasive analysis of wrist kinematics. This technique allows the calculation of numerous parameters; however, the interpretation of these parameters is often based on unidirectional wrist movement. Hysteresis is a phenomenon in which carpal bone movement varies depending on the direction of motion. The need to consider the hysteresis effect in evaluating wrist motion dynamics remains unclear, as it is unknown whether there is a difference in hysteresis between healthy and scapholunate-injured wrists.

Aim: to investigate the difference in hysteresis effects on dynamic CT-derived wrist kinematics between healthy and scapholunate ligament-injured wrists.

Material & Methods: Dynamic CT scans of healthy wrists and of wrists with arthroscopically-confirmed Geissler IV SL injuries were analyzed. Each scan consisted of one static image and two dynamic imaging sequences: radial-ulnar deviation (RUD) and flexion-extension (FE). Bones were automatically segmented, and five kinematic parameters were automatically calculated in each wrist position: the radioscaphoid (RSA), scapholunate (SLA), capitolunate (CLA), radiolunate (RLA) angles, and the 3D scapholunate distance (SLD). After calculating the kinematic parameters for each wrist position, motion curves were plotted for each parameter during both FE and RUD movements, with each movement analyzed separately for its two opposite directions. To determine the total hysteresis area, the area between curves for opposite motion directions was measured and normalized to the range of motion (ROM). An unpaired t-test ($p < 0.05$) was used to determine statistical differences between the two groups for each parameter.

Results: In the FE movement, twenty SL4 and 71 healthy wrists were analyzed. Of the five kinematic parameters only the SLD showed a significant higher total hysteresis area for the SL4 wrists (0.306 ± 0.273 deg2, $p<0.001$) compared to the healthy wrists (0.127 ± 0.078 deg2). In the radial-ulnar movement, 21 SL4 and 68 healthy wrists were analyzed. The total hysteresis area was significant higher for SLA and SLD in the SL4 wrist (2.921 ± 1.948 deg2, $p=0.00$ and 0.192 ± 0.104 deg2, $p<0.001$, respectively) compared to the healthy wrist (1.642 ± 0.809 deg2 and 0.102 ± 0.061 deg2, respectively). The other three kinematic parameters showed no statistical difference between the two groups during RUD movement

Conclusions: Automated motion analysis of dynamic wrist CT-scans showed a significant difference in the hysteresis effect between healthy and SL injured wrists. The total hysteresis area was significantly greater in SL-injured wrists for the SLD parameter during both FE and RUD movements, as well as for the SLA during RUD. Since hysteresis reflects how carpal bone movement varies with the direction of motion, these findings show that hysteresis may have the potential to serve

as a sensitive marker for detecting early or subtle scapholunate injuries that may be missed when only considering static or unidirectional movement. Future studies should expand on these findings by increasing the sample size of SL-injured wrists to better understand the variations in their kinematics and exploring the clinical utility of hysteresis as a potential prognostic and diagnostic parameter.

A-0820 35 CASES OF SIMULTANEOUS FRACTURE OF DISTAL RADIUS FRACTURES AND SCAPHOID

Kazuki Uchibori, Yuki Fujihara, Hideyuki Ota, Satoshi Niwa, Hideomi Takami
Nagoya Ekisaikai Hospital, Nagoya city, Japan

Introduction: Simultaneous fractures of distal radius and scaphoid are rare. Some studies reported that 5% of distal radius fractures are in combination with scaphoid fractures. The aim of this study is to review its characteristics and outcomes
Material & Methods: Simultaneous fractures of distal radius and scaphoid which were diagnosed between November 2008 and November 2023 were reviewed in this study. We evaluated the mechanism of injury, radiological characteristics, and bone union rates
Results: 35 patients were identified. 31 of 35 were males and 4 of 35 were females. The mean age was 35 years (range, 11-82 years), 8 cases were younger than 17 years and 27 cases were 17 years or older. High-energy trauma, such as traffic accidents and falls, accounted for 88.5% (31 cases) of the injuries. Regarding distal radius fractures, intra-articular fractures accounted for 80% (28 cases) in total and 96% (26 cases) in patients 17 years or older, whereas only 25% (2 cases) in patients younger than 17 years. The fracture type of scaphoid fractures was waist in 74% (26 cases). In addition, 85% (30 cases) of scaphoid fractures were nondisplaced, and 7 cases could not be diagnosed on initial radiographs. 31 cases were treated and 26 of them underwent surgery. Bone fusion was achieved in 30 cases, except for one case that could not be followed up
Conclusions: In our study, most of the patients of simultaneous fracture of distal radius and scaphoid were young males, and most of the mechanism of injury was high-energy trauma. Some studies recommend computed tomography (CT) and magnetic resonance imaging (MRI) for the diagnosis of carpal fractures in intra-articular fractures of the distal radius after high-energy trauma, but in our study, extra-articular fracture is more common especially in cases under the age of 17. It should be noted that patients under the age of 17 are less likely to undergo CT or MRI, which may result in more missed scaphoid fractures. In both operative and non-operative cases, treatment results showed high rates of bone union.

A-0821 SIMILAR EFFECTS OF CARPAL TUNNEL SYNDROME TREATMENT IN PATIENTS WITH AND WITHOUT FIBROMYALGIA: A PROPENSITY-MATCHED ANALYSIS

Eva Lindner[1], J. Rutten[1], R.Selles[1], Hand Wrist Study Group, O. Zöphel[2]
[1]Department of Plastic, Reconstructive, and Hand Surgery, Erasmus MC, Rotterdam, the Netherlands; [2]Hand and Wrist Center, Xpert Clinics, Amsterdam, The Netherlands

Introduction: Fibromyalgia (FM) is a chronic pain syndrome affecting up to 6.6% of the population and is associated with higher complication rates, lower satisfaction, and worse postoperative outcomes following orthopedic surgeries. This suggests that FM may also influence treatment outcomes for Carpal Tunnel Syndrome (CTS), the most common entrapment neuropathy. Previous research showed that FM-patients with CTS experience less improvement in the Symptom Severity Scale (SSS) following steroid injections and report lower satisfaction following carpal tunnel release.

Yet, there is no study that assesses the differences in treatment outcomes for both conservative and surgical treatments according to ICHOM-standards.
Aim: This study aims to compare the Symptom Severity Scale (SSS), Numeric Pain Rating Scale (NPRS), goal achievement, and patient satisfaction with treatment at 3-month follow-up between FM patients and non-FM patients with CTS.
Material & Methods: This study included patients diagnosed with CTS who completed their intake questionnaire and the Boston Carpal Tunnel Questionnaire (BCTQ), including the SSS at baseline and 3 months. Patients were assigned to the FM group if they self-reported FM in the intake questionnaire. FM patients were matched to non-FM patients using propensity score matching. We used an independent t-test or Mann-Whitney U test to compare the BCTQ (SSS) and NPRS (rest, load, and function), and we used a Chi-squared test to compare the satisfaction with treatment and the achievement of treatment goals between FM patients and those without FM.
Results: A total of 291 patients were included after 2:1 propensity score matching, of which 97 were FM patients. At baseline, there were no statistically significant differences between FM and non-FM patients in SSS and the NPRS (mean SSS: 3.2 vs. 3.1, $p = 0.732$; median NPRS rest: 5.0 vs. 5.0, $p = 0.298$; median NPRS load: 6.0 vs. 6.0, $p = 0.584$; median NPRS function: 5.0 vs. 5.0, $p = 0.233$), indicating that matching was successful. Both groups significantly improved in all outcomes. At three months, SSS showed a difference, indicating FM patients experienced more severe symptoms (median 2.2 vs. 1.9, $p = 0.049$), while no differences were noted in the NPRS (median NPRS rest: 2.0 vs. 2.0, $p = 0.466$; median NPRS load: 3.0 vs. 3.0, $p = 0.706$; median NPRS function: 6.0 vs. 7.0, $p = 0.343$). Satisfaction levels were comparable between FM and non-FM patients (86% vs. 91% would recommend treatment, $p = 0.399$; 82% vs. 86% would undergo treatment again, $p = 0.562$; 56% vs. 57% were satisfied with the treatment, $p = 0.495$), and there were no differences in treatment goal achievement (38% vs. 48%, $p = 0.178$)
Conclusions: The three-month SSS indicated a difference, with FM patients having worse symptoms. This study suggests that FM impacts CTS treatment, but these slight differences should not discourage hand surgeons from treating FM patients.

A-0822 PROGRESSION OF THERAPEUTIC EXERCISE LOADS AFTER REPAIR OF ISOLATED VOLAR COMPONENT INJURY OF THE SCAPHOLUNATE LIGAMENT: CASE REPORT

Federica Potenza[1], Greta Colaiacovo[1], Lucian Lior Marcovici[2]
[1]Centro Mano Roma, Rome, Italy; [2]Israeli Hospital, Rome, Italy

Introduction: The scapholunate ligament is the main stabilizer of the scapholunate joint. The dorsal component (dSL) has the highest load resistance and limits translational and rotational movements, while the volar component (vSL) helps to maintain the rotational stability of the scapholunate joint. An injury to the volar component can cause pain and functional impairment. This case report presents the rehabilitative treatment of a young adult following arthroscopic repair of the vSL after a scaphoid fracture.
Aim: The aim of the study was to propose the possibility of distinguishing the progression of therapeutic exercise loads during treatment, based on the type of scapholunate ligament injury.
Material & Methods: In this case report, we treated a patient with an injury to the volar portion of the scapholunate ligament, who underwent volar capsulodesis of the right (dominant) wrist. Rehabilitative treatment began after 4 weeks of immobilization post-surgery. We assessed ROM, functionality using the QuickDASH scale, grip strength, and static and dynamic load distribution with force platforms, and set up a progressive load-bearing therapeutic exercise program over 6 weeks. Based on the rehabilitation protocol for dorsal component injuries, and considering the evaluations, the timelines for both axial load and traction exercises were advanced.

Results: The treatment involved a progressive load-bearing therapeutic exercise program. The load increase was determined based on the results obtained from the evaluations. Over 6 weeks, the patient showed a 93% improvement in ROM (F/E 85%; DR/DU 94%; P/S 100%). The QuickDASH scale indicated a 64% reduction. Grip strength showed a 1% difference between the two limbs. The static weight distribution showed a 3.3% asymmetry, while dynamic weight distribution showed a 0.6% asymmetry between the healthy and operated limbs.
Conclusions: Injuries to the volar component of the scapholunate ligament may be one of the causes of dynamic instability of the scapholunate joint, leading to pain and functional impairment. This study highlights the possibility of differentiating the rehabilitative treatment for various types of injuries and, based on the results obtained, replicating this approach in other cases with the same injury to expand the data collected for future studies.

A-0823 EVALUATING THE IMPACT OF VITAMIN B12 ON MILD TO MODERATE CARPAL TUNNEL SYNDROME: A RANDOMIZED CONTROLLED TRIAL

Yuwarat Monteerarat, Thammasak Hunsuwan
Siriraj Hospital, Mahidol University, Bangkok, Thailand

Introduction: Carpal tunnel syndrome (CTS), a common peripheral nerve disorder, lacks evidence supporting the use of vitamin B12 in its treatment, despite vitamin B's established role in nervous system function.
Aim: This study hypothesized that daily oral supplementation with vitamin B12 or a combination of vitamins B1, B6, and B12 containing 1000 micrograms of cobalamin could improve clinical outcomes in patients with mild to moderate CTS.
Material & Methods: A total of 108 patients with clinically and electromyography-confirmed mild to moderate CTS were randomly assigned to three groups (n=36 each) using block randomization. Group A received Methylcobalamin, Group B received a combination of vitamins B1, B6, and B12, and Group C received a placebo. Clinical outcomes were assessed using the Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) and the Douleur Neuropathique 4 (DN4) questionnaire. Baseline and 12-week follow-up data included scores from BCTQ's Symptom Severity Scale (SSS) and Functional Status Scale (FSS), DN4 scores, and serum vitamin B12 levels. A paired sample t-test evaluated pre- and post-intervention changes, while ANOVA with Bonferroni correction analyzed differences among groups.
Results: Of the initial participants, 89 completed the follow-up. No differences were observed in baseline demographic characteristics (gender, age, occupation, affected side, severity, comorbidities). All groups demonstrated reduced BCTQ and DN4 scores, indicating clinical improvement; however, the intervention groups did not show statistically significant improvements compared to the placebo. Serum vitamin B12 levels increased significantly in the intervention groups but did not correlate with clinical outcome measures.
Conclusions: Twelve weeks of daily oral supplementation with vitamin B12 or a combination of vitamins B1, B6, and B12 containing 1000 micrograms of cobalamin did not yield significant improvements in clinical outcomes for patients with mild to moderate CTS. Furthermore, elevated serum vitamin B12 levels were not associated with clinical benefits. Future research should explore alternative treatments or identify subgroups that may benefit from vitamin B12 supplementation.

A-0824 SPORTS ACTIVITY FOR PATIENTS WITH CONGENITAL ANOMALIES OF THE UPPER LIMB

Megumi Hanaka, Kousuke Iba
Department of Orthopaedic Surgery, Sapporo Medical University School of Medicine, Sapporo, Japan

Introduction: It is expected to improve sports participation rates both physically unimpaired person and the person with a disability. However, there are few reports on the sports activities of patients with congenital anomalies of the upper limbs.
Aim: To evaluate the sports activity of patients with congenital anomalies of the upper limb.
Material & Methods: A total of 223 patients with congenital anomalies of the upper limb, excluding preschool children, were included in the study. There were 133 males, 90 females, 135 elementary school students, 48 junior high school students, 14 high school students, and 26 college students and adults. We evaluated sports participation rates, diagnosis, sports events, treatment and surgical procedures.
Results: There were 44 sports practitioners, 33 males and 11 females, and the affected side was 16 right, 15 left, and 13 bilateral. The sports participation rates was 14% for elementary school students, 35% for junior high school students, 27% for high school students, and 15% for college students and adults. There were thumb polydactyly in 10, symbrachydactyly in 9, cleft hand in 6, congenital constriction band syndrome in 4, radial deficiency in 3, hemihypertrophy of upper limb in 2, and the other in 8 patient. The sports events were soccer in 11, basketball in 6, volleyball in 5, baseball in 4, badminton in 3, table tennis in 3, karate in 3, and dance in 3, swimming in 2 and other in 4 patients. There were 12 conservative treatment cases and 32 cases of surgical treatment. There were cases in which the patient was able to participate in sports after surgery.
Conclusions: In Japan, the sports participation rate of healthy people is as high as 60-87% among schoolchildren and adolescents, and 52% among those over 18 years of age. In this study, the sports participation rate of congenital anomalies of the upper limbs was 14-35%, which was lower than that of healthy subjects. On the other hand, 61% of the patients played sports mainly with their upper limbs and actively used their affected limbs. We believe that appropriate treatment and surgical details would be useful to improve sports activities of patients with congenital anomalies of the upper limb.

A-0826 OUR EXPERIENCES IN "MUSCLE ELEMENTALIZATION" TREATMENT OF MANAGED MUSCLE NECROSIS WITH COMPARTMENT SYNDROME

Yasin Canbaz, Osman Şamil SevindiK, Berkan Şanlı, Yunus Ertas, Percin Karakol
Plastic,Reconstructive and Aesthetic Surgery,Health Science University,Basaksehir Cam ve Sakura City Hospital,İstanbul,Turkey

Introduction: Compartment Syndrome is a painful clinical condition that occurs due to the increase in intra-tissue pressure resulting from traumatic changes within a compartment. Early treatment of acute compartment syndrome is fasciotomy. However, in cases of severe crush injuries, if necrotic muscle remains after debridement and antibiotic therapy cannot be managed properly, it may lead to infection. In some patients with renal failure and/or multiple organ failure, radical debridement of viable muscle may be required to prevent worsening of the systemic inflammatory response, which can lead to death.
After periods of critical ischemia, a technique called "muscle elementarization" has been developed to avoid the risk of complications associated with crushed muscles. Studies show that the elementarization method may be associated with low morbidity and provide long-term function without the need for amputation
Aim: In this study, we present our experience with 5 patients who underwent muscle elementarization at our clinic
Material & Methods: In this study, 5 earthquake victims who were injured in the 2023 Maraş earthquake, developed

compartment syndrome in the lower extremities, underwent fasciotomy, and were referred from different provinces were evaluatedResults: Five patients were included in this study. Three of the patients were female, and two were male. The average age of the female patients was 30.3 years, and the male patients' average age was 24.5 years. One of the five patients underwent above-knee amputation on postoperative day 7 due to general condition deterioration. All patients were followed for an extended period with Hemovac drains, which were removed once drainage was less than 30 cc. The patients were taken to the operating room every 2-3 days for dressing changes, infection load reduction, and evaluation for possible debridement.

All cases were given a resting splint for 3-4 weeks postoperatively. It was observed that in the majority of the patients, there was an increase in their mobility and function compared to preoperative levels, and the results were satisfying for the patients. Three patients started walking with crutches within 2 months

Conclusions: Total muscle excision after severe crush injuries in the lower extremity has been described previously. Reis and Michaelson reported seven patients initially treated with four-compartment fasciotomies who later developed myonecrosis. However, specific data or long-term follow-up were not defined.

A limitation of this study is the small number of cases

A-0828 IMPORTANCE OF SO-CALLED SECONDARY STABILIZERS OF THE CARPUS. ILLUSTRATION BY A CASE OF SCAPHOID DISLOCATION

Philippe Cuénod
Clinique de la Main - Geneve, Switzerland

Introduction: Treatment of scapholunate dissociation remains a challenge. The scapholunate ligament has long been considered the main stabilizer of the scapholunate couple. The role of so-called secondary stabilisers of the scapholunate joint is however increasingly recognized.

Luxation of the scaphoid is a rare injury with no long-term follow-up in the literature. A case is described with a 25 year FU after treatment of a scaphoid luxation, which illustrates the major role of the secondary stabilizers.

A 48-year-old, right-hand dominant man presented after a paragliding accident with swelling and tenderness of the right wrist and median nerve paraesthesia. Radiographs showed a trans-styloid perilunate dissociation with associated luxation of the scaphoid. Through an anterior approach the carpal tunnel was opened. The scaphoid appeared completely volarly and transversally dislocated and devoid of ligamentous attachments. After reposition, the scaphoid and lunate were stabilized with K-wires and the anterior extrinsic ligaments sutured (RSC, LRL, SRL). The scapholunate interosseous ligament (SLIL) was not addressed neither anteriorly nor dorsally. At 4 months postoperatively, after removal of pins and rehabilitation, the patient was able to resume work as a tile setter. At a 25 year FU, the patient reported to be pain free, very satisfied, and had a Patient-Rated Wrist Evaluation (PWRE) and Quick Disabilities of the Arm, Shoulder and Hand (DASH) scores of 0. The F/E was 60-0-45° on the right side and 70-0-60° on the left side; the grip strength 39 kg on the right side and 41 kg on the left side. The Watson test was negative. Radiographs showed no major instability, a correct scapholunate alignment, a well-preserved radiocarpal joint, but midcarpal arthritis. There was no sign of scaphoid avascular necrosis.

The evolution of this case shows that the SLIL may not be as important as previously thought and that the so-called secondary stabilizers, RSC, LRL, SRL, FCR tendon and sheath volarly, DIC dorsally, may actually be the main stabilizers, the SLIL ligament being only a keystone to close a ligamentous arc. Asymptomatic degenerative changes developed in the midcarpal joint, and not in the radiocarpal joint, underlining the stability of the scapholunate joint. The outcome of this lesion highlights the importance not only to focus on the SLIL, but also to assess and repair the so-called secondary stabilisers

Conclusions: The SLIL may rather be a secondary stabilizer, playing the role of a keystone of a ligamentous frame formed, volarly, by the FCR tendon and its sheath, the RSC, LRL, SRL ligaments and, on the dorsal aspect, by the DIC ligament.

A-0829 CLINICAL IMPLICATIONS OF FLEXOR DIGITORUM SUPERFICIALIS TENDON ABSENCE IN THE 5TH FINGER: A CASE REPORT

Musa Mert Tapki, Osman Samil Sevindik, Kevser Eren, Yunus Ertas, Percin Karakol
Basaksehir Cam and Sakura City Hospital, Plastic, Reconstructive and Aesthetic Surgery Department, Istanbul, Turkey

Introduction: The flexor digitorum superficialis (FDS) muscle is the largest muscle in the forearm's middle layer, with two heads: humero-ulnar and radial. It passes through the carpal tunnel, giving off four tendons that extend to the middle phalanges. The FDS is subject to significant anatomical variations, with the absence of the 5th finger FDS tendon (FDS-5) being the most common. A study in Turkey found a prevalence of 18.5%, and though it rarely limits daily activities, it can lead to misdiagnosis in cases of hand trauma. Surgeons must be aware of these variations to avoid errors.
Material & Methods: A 48-year-old female with a glass laceration in the left hand (flexor zone 5) was evaluated in 2024.
Case: The patient, with no significant prior disability in her left 5th finger despite limited flexion, was taken for surgery. She had a 5 cm wound, pain, and numbness in the left 2nd, 3rd, and 4th fingers, along with limited flexion in the 5th finger. Initial examination suggested potential injuries to the median and ulnar nerves, the ulnar artery, and the FDS-5 tendon. The exploration revealed a 90% injury to the median nerve, a 50% injury to the ulnar nerve, complete transection of the ulnar artery, and partial rupture of the flexor carpi ulnaris (FCU) tendon. The FDS-5 tendon was found to be rudimentary, confirming its absence. The patient's other injuries were repaired, and an MRI confirmed the lack of FDS-5.
Discussion: The FDS exhibits considerable anatomical variation, including variations in the muscle body, tendon structure, and intertendinous connections. FDS-5 variations are the most common, with frequent hypoplasia and connections to the FDS-4 tendon. Studies show varying prevalence rates: 18.5% in Turkey, 6.4% in China, 11% in India, 3.3% in Ireland, and 17.6% in the USA. The absence of FDS-5 is the most frequent variation and should be considered during trauma assessments to avoid misdiagnosis
Conclusions: The absence of FDS-5 is a well-documented variation that can lead to misinterpretation in hand trauma. Surgeons must carefully evaluate the anatomy of the hand to avoid misdiagnosis and ensure accurate treatment.
Keywords: 5th finger, Absence, Flexor Digitorum Superficialis, Variation

A-0830 TWIST OF THE WRIST: UNRAVELING AN UNCOMMON PERILUNAR DISLOCATION

Andrés Pérez Prieto, Raquel Maroto-Rodríguez, María Tibau Alberdi, Guillem Paz Ramírez, Maria Fernanda Gómez Blanco, Miguel Picallo Fernández, Claudia Castelló Mendoza
Hospital de Mataró, Barcelona, Spain

Introduction: Perilunate dislocations are rare but severe injuries of the wrist, accounting for approximately 7% of all carpal injuries.
Despite their rarity, they're among the most frequently overlooked wrist injuries, with a significant proportion initially missed. These delays often lead to compromised clinical outcomes including chronic pain, carpal instability and osteoarthritis.
Aim: To describe the characteristics, diagnostic process, and surgical management of a transstylo-perilunar dislocation,

an infrequent subtype of perilunar injury, through the presentation of a clinical case managed at our center.
Material & Methods: We report the case of a 42-year-old male who presented following an accidental fall during sports practice, resulting in a trauma with the wrist in extension and ulnar deviation.
Initial examination in the Emergency Department revealed swelling and significant functional limitation of the hand and wrist. Neurovascular assessment identified paresthesia in the pulp of the 2nd and 3rd fingers, with normal capillary refill and symmetrical distal pulses.
Radiographs showed disruption of Gilula's lines, the "piece of pie" sign, and an articular fracture of the radial styloid. The lateral view revealed the "spilled tea cup" sign. The lateral projection revealed the "spilled tea cup" sign.
Given the complexity of the injury, a computed tomography (CT) scan was performed, which confirmed a volar lunate dislocation (Mayfield stage IV), a radial styloid fracture, and the integrity of the remaining carpal structures.
Due to the inability to achieve a successful closed reduction under sedation, the patient was taken to the operating room for open reduction and internal fixation.
Results: Using a dorsal approach, the radiocarpal joint was accessed, and the lunate was successfully reduced into its fossa using Tavernier's maneuver.
The next step involved stabilizing the carpal structures with Kirschner wires (KW): first, the scaphocapitate joint, followed by the scapholunate and lunotriquetral articulations. The scapholunate ligament was repaired through reattachment using two anchors.
Finally, the styloid fracture was fixed with a cannulated screw.
As a final step, a volar approach was performed for prophylactic median nerve decompression.
In the immediate postoperative period, the patient demonstrated good clinical progress, with appropriate wound healing and preserved neurovascular status. Paresthesia in the fingers resolved progressively over the following days.
During outpatient postoperative follow-ups, the Kirschner wires (KW) and splint were removed at six weeks after confirmation of satisfactory clinical and radiological evolution, and a rehabilitation program was initiated.
At six months postoperatively, the patient demonstrated satisfactory wrist mobility with a range of motion comparable to the contralateral side and successfully returned to work by the fourth month
Conclusions: Perilunar injuries represent a therapeutic challenge due to their complexity and the high likelihood of functional sequelae. Early identification is crucial, as delays in diagnosis are reported in up to 25% of cases, significantly impacting prognosis.
Controversies persist in the literature regarding the optimal surgical approach, with discrepancies surrounding the use of dorsal, volar, or combined approaches, as well as the necessity of prophylactic median nerve decompression.
The case presented highlights the importance of a thorough clinical evaluation, complemented by appropriate imaging studies, to ensure accurate diagnosis and timely surgical management.

A-0831 SINGLE MUSCLE TRANSFER FOR SHOULDER ABDUCTION AND ELBOW FLEXION IN LATE PRE-GANGLIONIC PAN PLEXUS INJURIES FOR FLAIL UPPER EXTREMITY

MASOOD Khalid, Sohail Amir, Butt Kamran, Masood Rabia
Hand & Upper Limb Surgery Center, Lahore, Pakistan

The objective of this study is to share our experience of single muscle transfer to achieve abduction at shoulder and flexion at elbow for flail upper limb in late pan plexus injuries (C5-T1 roots avulsion) when options are negligible.
Methods: We managed 42 cases of pre-ganglionic pan plexus injuries during last 4.5 years. Mean duration of presentation

was 3.5 years after injury. All patients were having flail limb with zero power of all muscles of upper limb including latissimus dorsi and pectoralis major. Mean age of the patients was 32 years including 3 females. Minimum age was 14 years. We lifted upper and middle parts of trapezius muscle from its site of insertion and transferred to the Biceps tendon with the help of intervening Tensor Facia Lata graft. In addition, Levator Scapulae was transferred to the Supraspinatus. An improvised splint was applied to keep the shoulder and elbow at 90 degree for 04-6 weeks. Assisted movements followed by active physiotherapy was started at 06 weeks.

Maximum range of movements was achieved within 6-9 months. 39 (91%) patients showed improvement. On the basis of achieved movements and muscle strength 11 patients showed very good, 19 good, 06 fair results while 04 patients showed poor results those were improved by adjusting tension in secondary procedure. 03 patients didn't show any improvement. On average, 62 degrees of abduction at shoulder and 68 degrees of flexion at elbow was achieved with mean <_ M3 power by 12 months. Additional procedures were performed at wrist and fingers as per patient's need.
Conclusion: Trapezius transfer with the help of Tensor Fascia Lata graft to the Biceps tendon is a useful option to achieve reasonable movements at shoulder and elbow in patients presented with late pan-plexus injuries with flail upper extremity.

A-0833 RADIAL TO AXILLARY NERVE TRANSFER THROUGH THE AXILLARY APPROACH IN UPPER BRACHIAL PLEXUS INJURY. OUR TEN YEARS' EXPERIENCE

Panagiotis Kanellos, Sophia Syngouna, Franzeska Zampeli, Emmanouil Fandridis, Sarantis Spyridonos
'KAT' General Hospital of Athens, Greece

Introduction: Restoration of deltoid muscle in upper trunk brachial plexus injury (BPI) by transferring a radial nerve branch to axillary nerve through a posterior approach is a common procedure but it requires changing patient's position and a separate incision.
Aim: We present our experience of transferring α branch of radial nerve to axillary nerve through an axillary approach, combined with Oberlin procedure and spinal accessory to suprascapular nerve transfer.
Material & Methods: From 2014 to 2024, 18 patients with a mean age of 27.3 (range, 18-56), with upper trunk BPI were treated. The mean injury to surgery interval was 5.3 months (range, 2.5- 7.5). In all cases, the patients were placed supine with the arm abducted and externally rotated in the arm table. A single incision in the medial arm was made continued in the axillary fold. One or two branches of medial triceps are selected and transferred over latissimus dorsi tendon to the anterior and posterior division of axillary nerve.
Results: The mean follow up is 24 months (range 12- 72). No patient had any wound related complications. Elbow flexion was restored in all cases at a mean time of 6 months, shoulder abduction up to 90o was achieved in 16 out of 18 patients after mean time of 16 months and the mean external rotation was 30o
Conclusions: The axillary approach is a safe and reliable method for axillary nerve transfer in BPI. Good to excellent outcomes can be achieved that are comparable to existing data without requiring a separate posterior arm incision.

A-0834 EVALUATION OF ANKLE INSTABILITY DEVELOPMENT IN DONOR SIDE AFTER VASCULARIZED FIBULA GRAFT HARVESTING

Mustafa Melik Can, Akif Muhtar Öztürk, Resul Bircan, Furkan Tosun
Gazi University, Faculty of Medicine, Department of Orthopaedics and Traumatology, Ankara Turkiye

Introduction: Vascularized fibula graft is a well renowned option among vascularized bone grafts, there are various donor site complications, such as; decrease in foot motor strength, loss of sensation, flexion contracture of the FHL muscle, ankle pain and tenderness, and feeling of instability in the ankle. Current literature lacks sufficient knowledge regarding ankle instability as a long-term donor site complication.

Aim: We intended to compare presence of ankle instability in donor side versus to non operated side in patients who underwent bone reconstruction surgery using vascularized fibula graft, retrospectively. And bring out a new perspective to prevent distally left fibula lenght to prevent possible instability.

Material & Methods: 31 patients who underwent reconstruction with vascularized fibula graft at our institution's between 2013 and 2020 were retrospectively evaluated. AOFAS ankle–hindfoot scoring and FAAM Foot and Ankle usability measure were used as evaluation. Full-length standing, standard ankle radiographs were taken, the length of the removed fibula, the length of the fibula left in the distal part, the total fibula length, the tibial notch distance and the actual remaining fibula length were measured. Tibiofibular clear space, tibiofibular overlap, medial clear space, and talar tilt were measured from anteroposterior and mortise ankle radiographs. Minimum follow-up period was 24 months with maximum of 120 months. The actual remaining fibula length was obtained by measuring the length of the fibula above the tibial notch where tibial attachment site of the interosseous ligament minus migration distance.

Results: Comparisons between non-operated and donor side revealed significant changes in talar tilt, tibiafibular opening and tibiafibular overlap, medial opening and malleolar tip distance in AP and mortise views, ($p<0.001$). Measured migration distance of patients with a feeling of instability was significantly higher than that of patients without a feeling of instability ($t=-5.546$; $p<0.001$). As the actual remaining above-notch fibula/distal fibula increases, AOFAS, FAAM daily, FAAM sports and VAS values increase, ($p<0.05$).

In the ROC analysis, feeling of instability was associated migration distance more than 4,250 mm, actual remaining supra-notch fibula length below 36.1 mm. FAAM sports and FAAM daily scores were 90 and above at values above 39.50 mm, and ratio of value of 0.382 at actual remaining above-notch fibula to the distally remained length of the fibula. A negative significance was detected between the real remaining fibula above the notch and the tibiafibular clearance (high degree) on the A/P view ($p<0.001$).

Conclusions: Harvesting fibula, increase tibiofibular opening, medial opening and decrease tibiofibular overlap. This may be a result disturbed ankle mortis support and may be associated with a developing syndesmosis damage and instability. A threshold value of the actual remaining supra-notch fibula length below 36.1 mm, creates a feeling of instability, ratio of the fibula length above the notch on the tibia to the total length of 0.3 or more are required to get perfect FAAM>90 and AOFAS>80AOFAS scores. In cases where these values cannot be achieved, it will be wise to consider various fixation methods.

A-0835 LONG TERM FUNCTIONAL EFFECTS OF SUBPERIOSTEAL BRACHIORADIALIS TENDON RELEASE ON DISTAL RADIUS FRACTURE SURGERY

Akif Muhtar Öztürk[1], Hüseyin Emre Tepedelenlioglu[1], Baris Seven[2], Ibrahim Kaya[1], Deran Oskay[2]
[1]Gazi University, Faculty of Medicine, Department of Orthopedics and Traumatology, Ankara, Turkiye; [2]Gazi University Faculty of Faculty of Medical Sciences, Department of Physical Therapy and Rehabilitation, Ankara, Turkiye

Introduction: Volar approach, open reduction and internal fixation for distal radius fractures has gained popularity. Distal radius has a complex bony anatomy and play a paramount role in the wrist joint configuration. Achieving anatomical reduction and rigid stabilization is important goal of open surgery. Brachioradialis (BR) tendon tension and muscle contracture as attaches to radial styloid applies an important radial displacement force to fracture unit causing proximal, dorsal and radial displacement.

Aim: Subperiosteal release of brachioradialis from its distal attachment site has already proposed for easy handling of open reduction, however long-term effect of this release is not well documented, current literature mostly based on up to one year follow up studies. Current study aims to observe long term effect of BR release on elbow, wrist and hand functions as a unit.

Material & Methods: 124 patients (75 BR released, and 49 BR not released) whom have been operated for distal radius fractures during 2011-2019 time period retrospectively has enrolled in to study. Informed consents were obtained from patients. For all patients, operation durations, and pre-operative and post-operative radiographies evaluated for healing and reduction by measurements of radial and palmar inclination, and ulnar variance to calculate Dresdner score. Patients with multiple fractures, and received any forms of treatment other than volar plate fixation, and not willing to enroll study were exempted from study. Total 62 patients (43 BR released, and 19 BR not released) were enrolled into study. For functional evaluations; hand, wrist and elbow strengths, proprioceptive functions, and disability assessments are measured by means of Jebsen Test, peak torque values obtained from Cybex isokinetic dynamometer, key pinch, palmar pinch, tip pinch and grip strength measurements obtained from J-Tech Commander Grip Track Baseline Mechanical Pinch, active joint position sensation, DASH-T and NRS.

Results: There was no difference in Dresdner scores on pre-operative radiograms, however Dresdner scores were lower, indicating a better reduction on BR released group ($p<0.001$). Duration of surgery was significantly shorter in BR tendon released group ($p<0.001$), there were no significant difference in terms of patient satisfaction, elbow, wrist and hand range of motions, proprioceptive sensory functions, DASH scores, in all evaluated forms of strength, at injured side among both groups. There was a decrease supination force on BR released group, however this was not statistically significant.

Conclusions: Subperiosteal release of brachioradialis tendon during volar approach to distal radius fractures improve fracture reduction quality and result in shorter surgery duration without additional significant loss of function and disability.

A-0836 RETROSPECTIVE ANALYSIS ON IMPLEMENTATION OF THE BUNCKE TECHNIQUE IN REPLANTATION / REVASCULARIZATION

F. Fiumedinisi[1], H. Klein[1], B. Safa[2], J. Plock[1], F. Früh[1]
[1]Department of Plastic Surgery and Hand Surgery, Kantonsspital Aarau, Aarau, Switzerland; [2]The Buncke Clinic, San Francisco, USA

Introduction: In Switzerland the overall exposure towards replantation/revascularization has decreased over the years because of work-safety measurements and a high densitiy of hospitals. We report on the implementation of the Buncke Clinic (California, USA) technique on replantation and artery only replantation, respectively. (Hands-on) Teaching for

Surgeons and the OR team was performed to implement the technique to gain lower failure rate. Key maneuvers are the separate use of a back-table to address the amputate to tag the structures and prepare the osteosynthesis and tendon sutures. Furthermore the use of tourniquet allows fast, structured and save vessel anastomosis/reconstruction (backall-first). In addition generous use of reversed vein grafts was applied. If needed, tendon sutures and nerve coaptation/reconstruction could be done without tourniquet.
Material and method: The implementation of the Buncke principle on replantation and artery only replantation has been performed starting in 2023. From January 2023 to April 2024 there a total of 22 patients with 31 devascularizing injuries (revacularizations: 12, replantations: 16, artery-only: 3); incl. 1 foot and 1 arm) were treated in our hospital. Mean follow-up time was 173 (23-446) days. Mean age was 45 years
Results: The survival rate was 74% for replantations, 100% for revascularizations and 67% for artery only replantations. An artery-only replantation was done in 3 cases. Mean surgery time was 279 $\pm$ 115 min for replantations, 230 $\pm$ 90 for revascularizations and 155 $\pm$ 44 for artery-only replantations. The corresponding tourniquet times were 134 $\pm$ 52 min, 108 $\pm$ 114 min and 81 $\pm$ 27 min, respectively. In general 1 artery and 1 vein per digit were anastomosed or reconstructed with the backwall-first technique. 6 patients needed early revision due to thrombosis of either the artery or vein. Warm ischemia time was < 6h. Time to union after osteosynthesis was about 90 days.
Discussion: The implementation of a novel technique requires a very structured teaching and hands-on knowledge and skills sharing to improve overall outcome and success rates. Regional practice patterns should regularly be adapted to improve the functional outcome of this severe type of trauma to the hand.

A-0837 HOW WE PERFORM CORRECTIVE OSTEOTOMIES FOR THE MALUNITED DISTAL RADIAL DEFORMITIES ?

Khalid Masood, Kamran Butt, Amir Sohail, Shoaib Javed
Hand & Upper Limb Surgery Center, CMH Lahore, Pakistan

Introduction: Distal radial Malunion after fractures is still one of the most common complications presenting with deformities showing displacement in all three planes. One can see either dorsal or palmar angulation, translation, shortening or axial rotation
Objective is to share radiological and functional outcome after managing this deformities by applying our technique in our center.
Results: we managed 172 cases with different types of deformities during last 8 years by open wedge technique using cortico-Cancellous bone graft and fixing with fixed angle volar plate. We made the technique very simple by using the 3 K wires parallel to the joint line to direct the oscillating saw in a correct position. Radiological evaluation was performed by measuring the parameters ie Radial height, Volar tilt and Radial inclination, pre and post operatively. Functional was evaluated through quick dash score. This technique significantly improved radiological parameters and Clinically there was eminent improvement in wrist and forearm function, finger movements and grip strength.
Conclusion: Accurate corrective osteotomy is the hall mark of anatomical restitution and the rigid peculiarities of fixed angle volar plates provide the best fixation allowing early postoperative motion with credible outcome.

A-0838 THE WIDE-AWAKE APPROACH TO DUPUYTREN'S CONTRACTURE – OUTCOMES AND PERSPECTIVES

L Kenny[1], N Christodoulides[1], B O'Ceallaigh[1,2], A Hussey[1,3], K Joyce[1,3], T Qayyum[1,3], N McInerney[1,3]

[1]Plastic Surgery Department, Galway University Hospital, Galway, Ireland; [2]Physiotherapy Department, Galway University Hospital, Galway, Ireland; [3]Med Aesthetics, Galway Plastic Surgery, Galway, Ireland

Background and aim: Dupuytren's contracture is a fibroproliferative disorder which results in slowly progressive thickening and shortening of the palmar fascia, said to affect 8.2% of the global population. As a result, patients develop debilitating digital contractures, particularly of the metacarpophalangeal and proximal interphalangeal joints, thus leading to severe impairments in activities of daily living. The Wide-Awake Local Anaesthetic No Tourniquet (WALANT) approach represents a significant advancement in the management of Dupuytren's disease, offering patients a potentially safer, more efficient, and more accessible alternative to conventional surgical approaches. Yet, the evidence comparing the efficacy and safety of WALANT to general or regional anaesthesia, specifically in Dupuytren's fasciectomy, remains limited. Questions regarding whether this approach achieves comparable outcomes in terms of contracture correction, range of motion, and recurrence rates remain unanswered. The goal of this study is to show that the WALANT approach results in comparable patient outcomes to fasciectomy under general or regional anaesthetic with fewer associated risks.
Methods: A multicenter retrospective review was conducted on patients who underwent a Dupuytren's fasciectomy using the WALANT approach between December 2023 and September 2024. Data collected included patient demographics, pre-operative, and post-operative range of motion, length of post-operative physiotherapy and post-operative complications. A review of hospital records was conducted to collect demographic data as well as to assess operative notes. Physiotherapy documentation was also reviewed to collect data specific to pre-operative and post-operative range of motion and length of therapy.
Results: Data was collected on 45 patients who underwent a Wide-Awake Approach, comprising of 58 digits and 103 joints. The left hand was involved in 51% of cases, followed by the right hand in 49% of cases. The metacarpophalangeal joint was involved in 39% of cases, while the proximal interphalangeal and distal interphalangeal joints were involved in 53% and 8% respectively. Of the 58 digits included, the little finger was most commonly involved (57% cases), followed by the ring finger (34.48% cases). The thumb was the least common digit involved, seen in only 2% of cases. The average change in extension was seen to be 42.075 degrees for metacarpophalangeal joints, 51.145 degrees for proximal interphalangeal joints and 19.125 degrees for distal interphalangeal joints. The average length of physiotherapy overall was 45.6 days. Those included in the study were predominantly male (78%), with no significant difference in the age of patients noted.
Conclusions: Our results have shown that with appropriate facilities and surgical experience, the Wide-Awake Approach to Dupuytren's contracture is an easily accessible and safe surgical alternative which yields positive outcomes for patients. This approach avoids anaesthetic-related complications including post-operative nausea and vomiting, respiratory depression and prolonged hospital stay while still maintaining a bloodless surgical field. Our results also highlight that the Wide-Awake Approach can be carried out in an out-of-hospital setting, reducing the financial burden on healthcare systems and providing accessibility to treatment in community settings that prioritise outpatient procedures.

A-0839 ASSESSING OSTEOARTHRITIS RISK AFTER RETROGRADE INTRAMEDULLARY HEADLESS COMPRESSION SCREW FIXATION FOR METACARPAL FRACTURE: A MINIMUM SIX-YEAR FOLLOW-UP STUDY

Sergi Barrera-Ochoa[1], Pilar Saralegui[2], Rita Pereira-Cavaca[3], Melissa Bonilla-Chaperon[1], Andrés Alvial-San Martín[1,4]
[1]Institut de la Ma, Barcelona, Spain; [2]Hospital Italiano de Buenos Aires, Buenos Aires, Argentina; [3]Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal; [4]Hospital Clínico Herminda Martin de Chillán, Chillán, Chili

Introduction: Retrograde intramedullary headless compression screw are increasingly used for metacarpal fractures, but concerns about long-term complications, such as metacarpophalangeal osteoarthritis, persist.
Aim: This study evaluates osteoarthritic changes following this fixation method.
Material & Methods: A retrospective analysis of 41 patients treated with retrograde intramedullary headless screws between 2014 and 2018, with a minimum follow-up of 72 months. Fracture healing and joint changes were evaluated through radiographs and computed tomography, alongside functional outcomes including range of motion, grip strength, QuickDASH scores, and pain levels.
Results: At a mean follow-up of 87 months, no osteoarthritic changes or chondrolysis were observed. Grip strength in the operated hand was 35 kg (IQR 32.5–44.5), compared to 34 kg in the contralateral hand ($p > 0.05$). The screw affected an average of 17.5% of the metacarpal head's articular surface, with no significant erosion. Complications occurred in 4.8% of cases, and secondary surgeries in 2.4%.
Conclusions: Retrograde intramedullary headless screw fixation is a safe and effective treatment for metacarpal fractures, with no long-term osteoarthritic changes, minimal complications, and the benefit of early mobilization over a six-year follow-up.

A-0840 SCIATIC NERVE INJURY FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION SURGERY

Natalia Gutierrez Olivera, Maria Luz Paz, Jorge Soutullo, Matias Medrano, Christian Allende Nores
Sanatorio Allende, Córdoba, Argentina

Introduction: Nerve injuries are uncommon complications following anterior cruciate ligament reconstruction surgery (ACL-R). However, some authors have described few cases with saphenous, common peroneal or sciatic nerve injury associated to ACL-R with potential severe consequences for the patients.
Aim: To report a case of sciatic nerve injury during hamstring harvesting following ATR-R. Diagnosis, treatment and how to avoid it
Material & Methods: Case report: A 20-year-old male patient presented at Hand and Peripheral Nerve Clinic six weeks after undergoing arthroscopic ACL-R surgery on his left knee. He presented with foot drop and loss of sensation distally to the knee. He was unable to move his foot immediately post-operatively. Surgery report described the reconstruction was performed arthroscopically in a standard fashion using hamstring tendon graft after harvesting semitendinosus and gracilis. The fixation was carried out with 2 interference screw. On physical examination, a positive Tinel's sign was noted at the superior angle of the popliteal fossa. He was unable to achieve ankle and toes flexion, extension, inversion and eversion. Hypoesthesia was found on the lateral and posterior side of the leg and dorsal/plantar side of the foot. Radiographs confirmed proper placement of tunnels and implants. MRI and ultrasound studies revealed thickening of the sciatic nerve proximal to its bifurcation, with a diameter of 114 mm^2 compared to 17 mm^2 on the contralateral side. Electroneuromyography showed slowdown conduction on tibial and common peroneal nerve, it was thought a neuropraxic injury above its bifurcation in the posterior compartment of the thigh.

We performed a sciatic nerve decompression surgery at the level of its bifurcation using a posterior approach to the popliteal fossa. Neurolysis of the sciatic nerve and its terminal branches was carried out, along with an epineurotomy of the common peroneal nerve after confirming its lack of response to electrostimulation.
Results: Six weeks postoperatively, the patient began to progressively recover motor function in the lower limb. By one-year post-operatively, the patient achieved full recovery of motor function (M5) and near-complete sensory recovery, with mild residual sensory deficits compared to the contralateral limb.
Conclusions: Sciatic nerve injury following harvesting of the semitendinosus-gracilis tendon graft is rare, with only one case reported in the literature. In the case we described, surgical exploration, neurolysis, and epineurotomy were required, with an initially uncertain prognosis. To prevent this type of injury, it is critical to advance the tendon stripper toward the ischial tuberosity while keeping it subcutaneous and to carefully position the leg to minimize sciatic nerve exposure and elongation during graft harvesting. ACL-R is a pretty common procedure, but surgeons should be aware about common but also rare complications such as sciatic nerve injuries, how to avoid, diagnose and treat them.

A-0841 CLOSED FIXATION OF MALLET FINGER WITH K-WIRES AND CERCLAGE (NEW SURGICAL TECHNIQUE FOR IVB-IVC BY DOYLE)

David Zakradze, Sophico Tsilosani
Zhordania medical center, Tbilisi, Georgia

Introduction: In general, mallet finger fracture is a work or sport-related injury, which is an avulsion of the extensor tendon from the base of the distal phalanx with a bony fragment . Various treatments have been proposed, but the optimal treatment choice is controversial. Various surgical techniques have been described , our technique is preferred for type IVb and IVc fractures.
Aim: The aim of this presentation is to describe and evaluate a surgical technique for the treatment of mallet finger fractures using a K-wires and cerclage for stabilization of the distal interphalangeal (DIP) joint .keep the joint in hyperextension do not penetrate the joint surface with K-wire.
Material & Methods: 15 patients (12 men, 3 women) with isolated closed mallet finger fracture that involves 20-50% and more joint surface were treated using 3 K-wires and cerclage do not penetrate through the joint.
Results: Union of all fractures took place at an average of 5.5 weeks after the surgical procedure. 11 fingers were excellent, four were good.
Conclusions: closed fixation of the bone fragment with the cerclage and K-wire was a useful technique in the treatment of mallet finger fractures.

A-0842 EXTENDED INDICATIONS FOR RETROGRADE INTRAMEDULLARY HEADLESS COMPRESSION SCREW FOR LONG OBLIQUE AND SPIRAL FRACTURE IN METACARPAL WITH HYBRID TECHNIC

Sergi Barrera-Ochoa[1], Pilar Saralegui[2], Rita Pereira-Cavaca[3], Melissa Bonilla-Chaperon[1], Andrés Alvial-San Martín[1,4]
[1]Institut de la Ma, Barcelona, Spain; [2]Hospital Italiano de Buenos Aires, Buenos Aires, Argentina; [3]Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal; [4]Hospital Clínico Herminda Martin de Chillán, Chillán, Chili

Introduction: The retrograde intramedullary headless compression screw (RICHS) technique has been used to treat metacarpal fractures with some established fracture patterns such as transverse and short oblique fractures, achieving excellent results

Aim: We present extended indications for the RICHS technique in the treatment of long oblique and spiral fractures in metacarpals, using a dorsal mini approach for the reduction with a cerclage of suture
Material & Methods: This retrospective study reviewed 27 patients from December 2021 with unstable patterns of fractures (11 spiral y 16 long oblique) treated with Hybrid technic, with a dorsal mini approach for the reduction with a cerclage of suture and a RICHS. Clinical outcomes — range of motion (ROM) and grip strength — were assessed bilaterally. Fracture healing and joint changes were assessed using radiographs and CT scans. Complications, secondary procedures, pain level (VAS), disability level (QuickDASH) and return to full activities were reported.
Results: All fractures healed in the CT scans at 3 months with an average union of 90% of cross-sectional trabeculation (SD: +/- 4,4; R: 83-97). At three months, all ROM measurements were similar in the treated and contralateral MCPJ. No extension lag was detected. Grip strength was 96,5% of the contralateral hand. Only one postoperative complication was detected by the large of the screw causing pain in the joint CMC. All patients returned to full activities by 22 days (SD +/- 4; R: 17-28). Mean pain VAS in activity was 0,56/10 (SD +/-0,75; R: 0-2) and QuickDASH score was 6,85/100 (SD +/- 6; R: 0-25). One secondary procedure was required, the removal of one screw.
Conclusions: The Hybrid technic have good results, long oblique and spiral fractures of the metacarpals, are amenable using a dorsal mini approach with a cerclage of suture and a RICHS. Long oblique and Spiral fractures of the shaft, base or neck could be treated with RICHS, but the approach to each patient must be individualized.

A-0843 PATTERNS OF PROXIMAL INTERPHALANGEAL JOINT DISLOCATIONS: INSIGHTS FROM A UK EMERGENCY DEPARTMENT

Charlie Bewsey[1], Grey Giddins[2]
[1]University of Exeter Medical School, Exeter, UK; [2]Royal United Hospital, Bath, UK

Introduction: Proximal interphalangeal joint (PIPJ) dislocations are the most common ligamentous injury of the hand and can result in significant disability and deformity. Previous studies have provided insights into the condition, but have mainly focused on injury settings, demographics, and treatment options. To this body of research, we have contributed data on the direction of dislocations, concomitant bony avulsion injury, and the incidence of open dislocations.
Aim: Our primary aim was to characterise the direction of PIPJ dislocations and the prevalence of open versus closed injuries across all fingers, to understand the underlying biomechanics better. We also wanted to know how these factors, and various others, affected outcomes.
Material & Methods: To obtain the data, every finger X-ray and associated radiology report taken in the emergency department between 03/07/2022 and 03/07/2024 was reviewed retrospectively. In each case, we recorded: hospital ID, name, sex, date of birth, date of presentation, mechanism of injury, hand injured, finger injured, direction of dislocation, bony avulsion injury, open/closed, and number of follow-up appointments. Of the 95 cases originally found, 21 were excluded for not being clear-cut dislocations. Therefore, 74 cases (77.9%) were included in the data set.
Results: Out of the 74 PIPJ dislocations included in our data set, 56 (75.7%) were male and 18 (24.3%) were female. The average age at time of presentation was 46.3 years old with a range of 14-87 years old. 'Sport' and 'Fall' were the most common mechanisms of injury, resulting in 36 (48.6%) and 28 (37.8%) dislocations, respectively. In 42 (56.8%) cases, the right hand was affected while the left was involved in 32 (43.2%) cases; hand dominance was not recorded. The most frequently injured digit was the little finger (43.2%), followed by the ring (33.8%), middle (14.9%), and the index (8.1%). Across all fingers, the PIPJ most often dislocated in a dorso-ulnar direction, accounting for 36 (48.6%) cases. 30 (40.5%) dislocated dorsally, 5 (6.76%) ulnarly, 2 (2.7%) volarly, and only 1 (1.4%) in a dorso-radial direction.

Conclusions: The data suggest the existence of two distinct groups experiencing PIPJ dislocations: young males dislocating their little finger during sport, and older patients sustaining middle finger dislocations after falling. 20% of patients do not do well initially, indicated by requiring more than three follow-up appointments. Factors associated with this include: increased age, open dislocation, female sex, presence of concomitant bony avulsion injury, and dislocating the index or middle finger. Open dislocations had significantly fewer bony avulsion injuries compared with closed dislocations ($p<0.0064$) and almost always occurred in the index or middle finger in a dorsal direction. This may be due to increased stiffness of the radial digits at the carpometacarpal joint, reducing finger flexibility and increasing the force at the PIPJ. True volar dislocations are rare as are irreducible dorsal dislocations, of which there was only one case that necessitated operative management. Volar dislocations never occurred due to a simple fall, but rather from a complex injury.

A-0844 SECONDARY RECONSTRUCTIVE PROCEDURES AFTER HAND ALLOTRANSPLANTATION IN CONGENITAL DEFORMITY - LONG TERM RESULTS

Adam Domanasiewicz[1], Jacek Martynkiewicz[1], Jerzy Gosk[2]
[1]Provincial Specialist Hospital, Wrocław, Poland; [2]Wrocław University of Science and Technology, Department of Medicine, Wrocław, Poland

Introduction: The authors performed world's first successful hand transplantation in congenital hand deficiency on the 15.12.2016 into a 32 years old male, born without a hand on the wrist level. The later course has been so far uneventful except of few acute mild rejection episodes. Despite limited sources of active muscle structures in recipient's forearm stump (3 pseudo flexores and 3 pseudo extensors only) allotransplantation procedure reduced disability of the patient and DASH from 80.5 to 37.04. Significant difference in cross-section of the median, ulnar and radial nerves between donor and recipient resulted in prolonged and limited return of sensation (Semmes-Weinstein (A 1,65)) to compare with allotransplantations experiences in posttraumatic cases. Because the intrinsic and thenar muscles function was not reestablished, authors decided to perform secondary reconstructive procedures

Aim: Presentation of secondary reconstructive possibilities to improve results of the hand allotransplantation in congenital deficiency.

Material & Methods: The Burkhalter's opponensplasty EIP on APL, EPL rerouting, split tenodesis FPL/EPL and Zancolli lasso II-V was performed.

Results: The function of the transplanted hand has improved with further DASH reduction to 13.39 and HTSS rised to 80.5. Additionally first web space widening according to Shaw or Iselin is planned.

Conclusions: The achieved level of dexterity of the transplanted hand, sensation and improved quality of life, both in patient's and authors' opinion, fully justify the allotransplantation as a treatment option in select congenital cases and also the need of additional multi-stage reconstructive procedures following the main operation.

A-0845 NEURAL NETWORK MODEL FOR CLASSIFICATION OF DISTAL RADIUS FRACTURES ACCORDING TO AO/OTA 2018 FRACTURE AND DISLOCATION CLASSIFICATION COMPENDIUM

Sara Severin, Belma Duderija, Andrej, Andrej Savin, Cecilia Mellstrand Navarro, Olof Sköldenberg, Martin Magneli, Max Gordon

[1]Karolinska Institutet, Department of Clinical Science, Danderyd Hospital, Division of Orthopedics, Stockholm, Sweden; [2]Danderyd University Corp. Department of Orthopedics, Stockholm, Sweden

Introduction: Present classification systems for Distal Radius Fractures (DRF) demonstrate low intra- and interrater reliability. While Artificial Intelligence (AI) has shown high accuracy in detecting DRF, its effectiveness in complex classification tasks remains unproven.

Aim: Development of a prediction model using a Convolutional Neural Network (CNN) to classify DRF according to the AO/OTA 2018 Fracture and Dislocation Classification Compendium.

Material & Methods: Diagnostic AI study using a CNN network of ResNet type with 39 layers. 10 539 clinical wrist radiograph exams conducted between 2002-2016 were extracted from the Picture Archiving and Communication System (PACS). Radiographs were identified through the Radiology Information System by key phrases as "Colles", "Distal radius fracture", "Smith", "Barton" and "comminuted". Radiographic exams each contained 2-7 views, were anonymized during extraction and divided into a training set (n =9781), a validation set (n= 413) and a test set (n=345). Input images were labeled by the research group according to the AO/OTA 2018 Fracture and Dislocation Classification Compendium. Additionally, we labeled for additional modifiers like diaphyseal extension, malalignment and hooking of volar cortex. Consensus sessions were performed continuously. Outcome was the probability of a specific subgroup fracture. Statistic analysis was performed using R software (version 4.4.0) and results were presented as sensitivity, specificity, Youden's J and Area Under the Curve (AUC).

Results: The CNN model performs with AUC values exceeding 0.80 over most fracture subgroups with lower end of the AUC Confidence Interval rarely below 0.7. Categories representing malalignment and results of reposition reached AUC values of 0.89-0.91 and high sensitivity and specificity.

Conclusions: Our CNN model accurately classifies DRF according to the AO/OTA 2018 Fracture and Dislocation Classification Compendium. Our model effectively identifies poor fracture reposition and absence of volar hooking. Following external validation, the model could be implemented in research and clinical practice.

A-0846 DELAYED POSTERIOR INTEROSSEOUS NERVE PALSY CAUSED BY BICORTICAL SUTURE BUTTON NERVE ENTRAPMENT FOLLOWING DISTAL BICEPS TENDON REPAIR: CASE REPORT AND MULTI-INSTITUTION OUTCOMES ASSESSMENT OF PIN INJURY FOLLOWING DISTAL BICEPS REPAIR

Fraser Leversedge[1], Alex Lauder[1,2], Eric McCarty[1], Edward Gill[1], Emma Judge[1], Kacey Peek[3]

[1]University of Colorado School of Medicine, Aurora, USA; [2]Denver Health Medical Center, Denver, USA; [3]University of Virginia School of Medicine, Charlottesville, USA

Introduction: Posterior interosseous nerve (PIN) injuries are rare but recognized complications of distal biceps repair. Direct injury may be caused by guide wire, drill or implant placement based on local PIN anatomy, and indirect nerve pathology has been reported associated with post-repair scar or heterotypic ossification. This case report identifies the potential for the implant to "capture" / entrap the PIN during rehabilitation and forearm motion based on implant positioning and local PIN anatomy. This complication is highlighted by a delayed presentation of PIN palsy.

Aims: (1) To describe a unique case of delayed postoperative PIN palsy caused by implant entrapment of the PIN during

forearm motion for rehabilitation following a bicortical distal biceps suture button repair technique. (2) To present a retrospective multi-center outcomes analysis of bicortical suture button technique for distal biceps repair and incidence of PIN injury.

Material & Methods: (1) Case report: A 63-year-old male was referred to our clinic 6-weeks following distal biceps tendon repair with a bicortical suture button technique with a 1 week onset of progressive PIN weakness, progressing to complete palsy by 3 months. Patient and clinic examinations immediately post-operatively confirmed intact nerve function. The patient underwent nerve exploration at 3.5 months following biceps repair via a Thompson approach at which time the PIN was observed to be entrapped, coursing deep to a limb of the suture button. Suture button removal and neurolysis was performed and PIN recovery gradually recovered to essentially normal function by 15 months post-operatively. (2) A multi-center, retrospective review of patients undergoing distal biceps repair using a bicortical suture button was conducted at the authors' institutions to assess the incidence, timing, severity, and treatment of potential PIN injury associated with the biceps repair.

Conclusions: (1) Timing of nerve post-operative deficit following bicortical suture button use for distal biceps tendon repair is an important consideration for determining mechanism of injury and treatment; (2) Subacute or delayed PIN palsy may be associated with nerve capture / entrapment by the suture button during post-operative rehabilitation and nerve exploration may be indicated; (3) As direct and indirect nerve injury may be associated with bicortical suture button use, decreased risk may be realized with a unicortical button technique; (4) Nerve injury following distal biceps tendon repair is likely under-reported in the peer-reviewed literature.

A-0847 MIDCARPAL ULTRAWIDE SCAPHOLUNATE CAPSULO-LIGAMENTOPLASTY (MUSCL) AND VOLAR SCAPHO-TRAPEZIAL ANATOMIC RECONSTRUCTION (VSTAR) FOR IWAS GRADE 5 SCAPHOLUNATE INSTABILITY - 12 MONTH CLINICAL OUTCOME IN 18 PATIENTS

Nicholas C Smith[1,2], Jasan Dannaway[2], Natalia Piet[2]

[1]Specialty Orthopaedics Upper Limb Surgery, Sydney, Australia; [2]Macquarie University Hand and Upper Limb Unit, Sydney, Australia

Introduction: Arthroscopic dorsal capsulodesis has been shown to have excellent results in the management of scapholunate instability. The exceptions are in higher grade instabilites, with increasing radiologic malalignment (IWAS grade 5). Modular minimally invasive reconstructions are of interest in that multiple compromised extrinsic ligaments may be addressed with minimal potential for iatrogenic harm. Specifically, bone tunnels and their problems are avoided and there is minimal damage to intact ligaments, as may result from open surgery.

The MUSCL procedure is a midcarpal arthroscopic capsuloplasty which aims to augment the scapholunotriquteral, DIC-L and DIC-S ligaments and imbricate the DIC to DRC ligaments. It does not require any residual scapholunate ligament tissue. The VSTAR procedure augments the volar scapho-trapezial ligament, using a free tendon graft into blind 8mm long scaphoid and trapezium tunnels.

The MUSCL and VSTAR procedures are two of the earlier members of a suite of currently available techniques, that can be used in combination to treat carpal instability.

Aim: To present the 12 month outcomes of combined MUSCL and VSTAR procedures for IWAS grade 5 scapholunate instability in 18 patients.

Material & Methods: We identified 21 patients who had combined MUSCL and VSTAR procedures for IWAS 5 scapholunate instability with more than 12 months follow-up and who had adequate pre-operative data. Of these, 18 were available

to complete scores and for examination. Pre-operative data included quick DASH (qDASH) scores and range of motion. Post-operative data included qDASH scores, range of motion and grip strength.
Results: Pre-operatively, the average qDASH score was 54. Average dorsiflexion was 70° (range 40°-90°) and average palmar flexion was 72° (range 40°-90°). Post-operatively, the average qDASH score was 17. The average dorsiflexion was 68° (range 30°-85°) and average palmar flexion was 69°(range 55°-80°). The average grip strength was 48kg. The average improvement in qDASH score was 42. There were three patients considered failures, in that they were unable to return to all activities of daily living and unrestricted work activities. All three of these patients had pre-operative qDASH scores greater than 70 and had chondral change of the proximal scaphoid noted intra-operatively. Of the three failures, all demonstrated improved qDASH scores, the smallest improvement was by 8 points. Four patients had qDASH scores of more than 70 pre-operatively and all of these patients had proximal scaphoid chondral change noted intra-operatively. Only one of these 4 patients was able to return to unrestricted work and all activities of daily living following the procedure.
Conclusions: The combination of MUSCL and VSTAR procedures shows promising early results in the management of IWAS 5 scapholunate instability, with minimal scope for iatrogenic problems. Pre-operative qDASH scores of more than 70 are associated with early arthritic change and compromised results following these procedures.

A-0848 MINIMALLY INVASIVE RADIO-LUNATE IMBRICATION/NEUTRALISATION (MIRLIN) PROCEDURE

Mark Ross[1,2], Nicholas C Smith[3,4], Matt White[4], Greg Cousins[1,2], S Cantwell[5], Sanj Kakar[5]
[1]Brisbane Hand and Upper Limb Clinic, Brisbane, Australia; [2]University of Queensland, Brisbane, Australia; [3]Specialty Orthopaedics Upper Limb Surgery, Sydney, Australia; [4]Macquarie University Hand and Upper Limb Unit, Sydney, Australia; [5]Mayo Clinic, Rochester, Minnesota, USA

Introduction: Debate persists about the optimal surgical management of scapholunate dissociation. Many contemporary techniques address both the injured scapholunate ligament as well as the capsuloligamentous stabilizers necessary to prevent carpal instability and collapse. Here we present a novel technique to reinforce or plicate the long radiolunate ligament, a critical stabilizer to the carpus, which may have been injured or become attenuated in case which exhibit marked DISI deformity. Arthroscopic-assisted long radiolunate ligament capsulodesis may be considered in the treatment algorithm for scapholunate dissociation.
Aim: To present two techniques of arthroscopic assisted long radiolunate ligament plication.
Material & Methods: We have designed two techniques for arthroscopic LRL plication, which have undergone evaluation for safety in the anatomy laboratory and early clinical implementation. The first involves inside-out suture passage from the radio-carpal joint to a volar mini-open approach. This technique does not require a scapholunate gap. The second technique is outside-in, taking a wider bite of LRL from the midcarpal and radiocarpal joints, and does require a wide scapholunate gap for suture passage.
Results: In the anatomy laboratory, both techniques were found to be effective in imbricating the LRL. For the outside-in technique, the closest structure at risk is the FPL tendon. Examples of early clinical cases and operative technique are presented.
Conclusions: The MIRLIN procedures may represent a useful adjunct to arthroscopic management of scapholunate dissociation. The combination of arthroscopic LRL plication with vST reconstruction, RADiCL, and MUSCL can produce all of the important stabilizing components used in open procedures without the need for open incisions or transosseous tunnels within the carpal bones. Future efforts should include investigation into clinical outcomes of LRL imbrication.

A-0849 MIDCARPAL ULTRAWIDE SCAPHOLUNOTRIQUETRAL CAPSULO-LIGAMENTOPLASTY (MUSCL) PROCEDURE TECHNIQUE

Nicholas C Smith[1,2]
[1]Specialty Orthopaedics Upper Limb Surgery, Sydney, Australia; [2]Macquarie University Hand and Upper Limb Unit, Sydney, Australia

Introduction: Arthroscopic dorsal capsuloplasty (ADCLR) has excellent results in many cases of scapholunate instability and has grown in popularity as a relatively simple and effective technique. It also carries minimal risk of iatrogenic harm. More recent variations include the wide ADCLR and the supercapsuloplasty, which aim to incorporate a wider bite of soft tissue in the suture.
The MUSCL procedure aims to take the maximum possible bite of the scapholunotriquetral ligament and associated DIC-L and DIC-S, as well as imbricating the DIC to DRC ligaments. No residual stump of scapholunate ligament is required for the procedure to be effective. The MUSCL suture may be interlocked with a RADiCL suture in cases where the DIC-L has been avulsed from the lunate, or combined with minimally invasive volar reconstructions for higher grade instabilities.
Aim: To describe the arthroscopic MUSCL dorsal capsuloplasty, and provide case examples.
Material & Methods: The procedure is performed entirely with midcarpal arthroscopy. A far ulna viewing portal is established to provide a panoramic view of the midcarpal joint, no switching of viewing portal is required. A working portal is established directly over the scapholunate interval. A radial suture (2-0 PDS) is introduced percutaneously (21G needle) through the most radial extent of the SLTq ligament, about 50% along the length of the scaphoid. The end of this suture is retrieved through the working portal at the SL interval. An ulna suture is passed percutaneously through the triquetral insertion of the SLTq ligment and the tail of the suture retrieved through the working portal. The radial suture is then used to shuttle the ulna suture back into the joint and out through the radial percutaneous entry site. This leaves a single suture passing percutaneously through the midcarpal joint, engaged in the SLTq ligament. The radial working portal is then elongated to 15mm and the percutaneous suture ends brought sequentially under the skin then under the extensor tendons, to lie in the interval between ECRB and EDC. The suture is then tightened and secured using a sliding knot. If a more robust suture is preferred (eg 0 ethibond), it can be shuttled into place with the 2-0 PDS prior to knot tying.
Results: The procedure is demonstrated with operative videos. The effect of the imbrication is demonstrated in a cadaveric specimen with the skin and extensor tendons removed. Around 30% compression of the engaged tissue sleeve can be expected. The technique is indicated alone for scapholunate instability IWAS grades 3b/c and 4, and as part of a modular reconstruction for IWAS grade 5.
Conclusions: The MUSCL procedure is a simple and useful procedure. At first glance, the technique seems complicated, however once well conceptualised, it can be seen to be easily and quickly accomplished.

A-0851 MECHANISM OF OCCURRENCE OF DORSAL ROOF FRAGMENTS IN DISTAL RADIUS FRACTURES

Norihiko Sugita, Shyota Hirashima, Toshiyuki Kanda
Ichinomiyanishi Hospital, Aichi, Japan

Introduction: Rare distal radius fractures can involve extra-articular dorsal fragments intruding into or becoming impacted within the joint. If untreated, these fragments may result in restricted joint motion, persistent pain, or tendon injuries. Such cases have been predominantly reported in Japan
Aim: This study aimed to review cases of dorsal roof fragments in distal radius fractures treated at our institution and investigate the underlying mechanisms of their formation.

Materials and Methods: We retrospectively analyzed 25 wrists with dorsal roof fragments among patients aged ≥16 years who presented with distal radius fractures. The evaluation criteria included mechanisms of injury, fracture displacement patterns, and classification of dorsal roof fragments. Fragments were categorized using Yamanaka's classification into four types: continuous (extending from the distal radius to the dorsal joint surface), free (detached and located on the dorsal aspect of the joint), intramedullary (protruding from the medullary canal into the articular surface), and impacted (embedded within the wrist joint). Additionally, Okazaki's "piercing" type, characterized by fragments penetrating carpal bones, was included.

Results: The mechanisms of injury were categorized as follows: falls from standing height (12 wrists), falls from a greater height (10 wrists), traffic accidents (2 wrists), and unknown causes (1 wrist). All distal radius fractures exhibited dorsal displacement. Fragment classifications were as follows: continuous (6 wrists), intramedullary (11 wrists), free (3 wrists), impacted (2 wrists), intramedullary + free (1 wrist), continuous + intramedullary + piercing (1 wrist), and intramedullary + free + piercing (1 wrist). All intramedullary fragments were located dorsally at the articular surface. Clinical complications included one case of extensor pollicis longus tendon rupture and another case requiring fragment removal due to persistent pain.

Discussion: Our findings, in conjunction with previous reports, allowed us to hypothesize the mechanisms underlying dorsal roof fragment formation. Axial compression on the radius generates a fracture proximal to Lister's tubercle. The precise direction of the compression determines whether the proximal fragment protrudes intra-articularly (intramedullary type) or remains extra-articular, maintaining continuity with the radius (continuous type). Secondary dorsal cortical fractures produce additional fragments. Larger intra-articular protrusions may cause further fractures, leading to free or impacted fragments. The rare piercing type appears to result from extreme wrist hyperextension, where fragments penetrate dorsally into carpal bones, as observed in our two cases.

A-0852 NON IRRITATING FIXATION WITH EMBEDDED KIRSCHNER WIRES FOR METACARPALS AND MIDDLE PHALANGEAL FRACTURE

Kuroki Yosuke[1,2], Ohishi Takato[1], Sugiura Kaori[3], Omura Takao[3]

[1]City Hospital, Iwata, Japan; [2]Mizoguchi Hospital, Fukuoka, Japan; [3]Hamamatsu University school of medicine, Hamamatsu, Japan

Introduction: Metacarpal and phalangeal fractures are among the most prevalent upper extremity fractures. Surgical management necessitates stable internal fixation to prevent complications such as pseudoarthrosis and rotational deformities. However, traditional Kirschner wire (Kw) fixation is associated with interference with surrounding soft tissues, while plate and screw fixation present challenges such as extensive soft tissue dissection and difficulties in securing implants, particularly in emergency scenarios like open fractures.

Aim: This study investigates a novel fixation technique, Non-Irritating Fixation with Embedded Kirschner Wire (NIFE-K), in which Kw is percutaneously inserted for fracture stabilization, cut flush with the bone surface, and embedded within the cortical bone. The outcomes of this method are compared to conventional fixation techniques.

Subjects and Methods: A total of 64 fingers (excluding thumbs) from 62 patients who underwent surgical treatment for metacarpal or proximal phalangeal fractures at our institution between 2015 and 2024 were included. The cohort had a mean age of 44.8 years, consisting of 54 male and 10 female cases. Fracture distribution included the index, middle, ring, and little fingers (n = 12, 10, 18, and 24, respectively), with 44 metacarpal and 22 proximal phalangeal fractures, including 24 open fractures. The NIFE-K technique was employed for 11 fingers (N group), while 53 fingers were treated

with conventional methods (C group). Treatment outcomes were compared between the groups.
Results: The mean final total active motion (TAM) was 245.0° in the N group and 227.5° in the C group. In terms of percentage TAM (%TAM), poor outcomes were observed in 1 finger (9.1%) in the N group and 8 fingers (15.1%) in the C group. The mean follow-up duration was 6.7 months. The average fracture union time was 3.3 months in the N group and 3.5 months in the C group. Postoperative infection rates were 9.0% in the N group and 5.7% in the C group. Statistical analysis revealed no significant differences between the groups in terms of TAM, union time, or infection rates.
Discussion: The NIFE-K technique offers an innovative approach to early internal fixation in open fractures, obviating the need for implant procurement when Kw is readily available. This method supports intramedullary fixation with versatility in terms of insertion points, lengths, diameters, and the number of wires used, facilitating early postoperative mobilization. Despite relatively favorable outcomes in the conventional group, challenges in standardizing conditions, particularly due to associated injuries such as extensor or flexor tendon ruptures, may have influenced the results.
Conclusion: The NIFE-K method provides a viable alternative to traditional plate-and-screw fixation, enabling internal stabilization without extensive soft tissue dissection. While this technique requires surgical expertise, it offers significant advantages in resource-limited settings and emergency scenarios, particularly for open fractures. Although no statistically significant differences were identified compared to conventional methods, the NIFE-K approach demonstrates potential as an effective, flexible fixation option.

A-0853 THE IMMEDIATE EFFECTS OF KINESIOLOGY TAPING ON SYMPTOMS, MOTOR PERFORMANCE, AND DEXTERITY IN PATIENTS WITH THORACIC OUTLET SYNDROME: A PILOT STUDY

Feray Karademir, Pınar Kisacik, Tüzün Firat
Hacettepe University, Physical Therapy and Rehabilitation Faculty, Ankara, Turkey

Introduction: Thoracic Outlet Syndrome (TOS) is characterized by the compression of neurovascular structures as they pass through the thoracic outlet, leading to a variety of symptoms, including pain, paresthesia, and functional impairments in the upper extremities. Overactivity of the scalene and pectoralis minor muscles leads to biomechanical changes, and therefore, interventions targeting these muscles are crucial in conservative management. Kinesiology Taping (KT) is used to inhibit overactive muscles, facilitate underactive synergists, reduce pain, relieve irritated neural tissue, and effectively reduce excessive muscle tension.
Aim: The aim of this study was to evaluate the immediate effects of KT on symptoms, motor performance, and manual dexterity in patients diagnosed with TOS
Material & Methods: This pilot study included 10 patients with TOS, consisting of 2 male and 8 female participants, with a mean age of 35.6 $\pm$ 10.4 years and a mean body mass index of 23.4 $\pm$ 3.5. Of the patients, 5 had dominant limb involvement and 5 had non-dominant limb involvement.
To assess motor performance, hand grip strength was measured using the JAMAR hand dynamometer. Manual dexterity was assessed using the Placing Test, a subtest of the Minnesota Manual Dexterity Test. Symptom provocation was assessed using the Roos test, recording time to symptom onset and time to test completion.
For treatment, KT was applied based on a technique targeting the scalene, pectoralis minor and biceps muscles. KT was applied to the affected side of the upper extremity according to this protocol.
After the application of KT, the same assessments were repeated 20 minutes later. The pre- and post-treatment results were compared using the Wilcoxon signed-rank test for statistical analysis.
Results: KT significantly improved hand grip strength and time to symptom onset. Pre-treatment grip strength was 28.7

± 4.8 kgf, which increasing to 32.9 ± 8.0 kgf post-treatment ($p = 0.005$), showing an average improvement of 4.2 kgf. Roos test results showed a significant delay in symptom onset, with a pre-treatment time of 21.8 ± 8.3 seconds and a post-treatment time of 29.6 ± 12.3 seconds ($p = 0.028$), a delay of 7.8 seconds. There was no significant change in the time to complete the Roos test ($p = 0.67$), with a pre-treatment time of 70.0 ± 35.4 seconds and a post-treatment time of 69.3 ± 22.8 seconds. No significant effect was found on manual dexterity, as measured by the Minnesota Manual Dexterity Test ($p = 0.35$)

Conclusions: The results of this pilot study suggest that KT may have immediate beneficial effects on both hand grip strength and symptom relief in patients with TOS. KT may help to alleviate the neuromuscular dysfunction associated with TOS, and may be a valuable adjunctive therapy in the management of the condition. While these preliminary results are promising, further research is needed to confirm the long-term efficacy of KT and to explore the optimal treatment regimens for this intervention. Larger sample sizes and longer follow-up periods will be essential to determine the sustained benefits of KT in the rehabilitation of TOS.

A-0854 MEDIAL FEMORAL CONDYLE AS A VERSATILE ALTERNATIVE VASCULARIZED BONE FLAP IN DIVERSE ORTHOPAEDIC CONDITIONS

Akif Muhtar Öztürk, Orkun Buyuksayin, Ozlem Orhan, Asim Ahmadov, Erdem Aras Sezgin, Serkan Savlik
Gazi Universtiy, Faculty of Medicine, Department of Orthopaedics and Traumatology, Ankara, Turkiye

Introduction: Bone defects and osteonecrosis present significant challenges in orthopedic practice, often necessitating innovative solutions beyond traditional grafting methods. Vascularized bone grafts, such as the medial femoral condyle (MFC) flap, have been shown to accelerate healing and provide superior biomechanical support through their live osteogenic cells and periosteal components.

Aim: Although initially popularized for scaphoid nonunion and carpal region reconstructions, MFC grafts have demonstrated versatility in treating complex conditions, including long bone defects, avascular necrosis, and challenging nonunions. This study evaluates the outcomes and efficacy of MFC grafting in managing diverse orthopedic conditions.

Material & Methods: We retrospectively reviewed the medical records of 71 patients who underwent MFC vascularized bone grafting for various indications between 2013 and 2023 at Gazi University Hospital. Indications included scaphoid nonunion, talar avascular necrosis, long bone nonunion, and traumatic metacarpal bone defects. Data on demographics, smoking status, prior treatments, surgical outcomes, and complications were extracted from hospital archives. Radiographic fusion outcomes were assessed by an experienced orthopedic surgeons. Descriptive statistics summarized patient and graft characteristics, with additional analyses performed excluding scaphoid cases. Statistical analyses were conducted using SPSS v27 for Mac.

Results: The study cohort had a mean age of 33.4 ± 13.9 years (range: 11–66), with 57.1% male patients. Scaphoid nonunion was the most common indication (32.9%), followed by forearm bone defects (18.3%), talar avascular necrosis (17.1%) humerus non-unions (11%), tibia nonunions (8.5), metacarpal and metatarsal defects (7.04%), femoral defects (2.8 %), clavicula (1.4 %) . Graft sizes ranged from 1 cm^3 to 30 cm^3 (mean 8.39 ± 13.88 cm^3), with maximum length of 7 cm. Radiographic fusion was achieved in 94 % of cases, nonunions were mostly associated with recipient-site infections, which was around 2.9% of cases, and two patients (2.9%) required revision surgeries. Excluding scaphoid cases did not alter the overall fusion rate or complication profile.

Conclusions: MFC flaps can be used as a workhorse particularly in compromised regions. With a success rate of 94 %, this study underscores the graft's reliability in achieving fusion while maintaining low complication rates. The versatility

of the MFC graft extends beyond scaphoid nonunion to applications in long bone reconstruction and avascular necrosis management. Its relatively low donor-site morbidity compared to vascularized fibula grafts highlights its utility as a safer and equally effective alternative. These findings support expanding the indications for MFC grafts in orthopaedic reconstruction.

A-0855 "DOCTOR, I CAN´T MOVE MY FINGERS!": THE USE OF WALANT IN REVISION REPAIR TENDON SURGERY

Miguel Picallo Fernández, Miguel Pérez Abad, Raquel Maroto-Rodríguez, María Tibau Alberdi, Andrés Pérez Prieto, Claudia Castellò Mendoza
Hospital de Mataró, Spain

Introduction: Cut wounds are very frequent in the upper limb. A thorough clinical evaluation and being meticulous when exploring the patient is vital to detect injuries and repair them. Surgical management in tendon repair can be very demanding technically, with suboptimal results if not treated correctly.
The introduction of Wide-Awake Local Anesthesia No Tourniquet (WALANT) in upper limb surgery has revolutionized the management of such injuries, allowing real-time assessment of tendon viability and repair functionality during the procedure.
Aim: The aim of this case is to emphasize the importance of a proper clinical evaluation in this type of injuries. As well, we want to demonstrate the safety and effectiveness of WALANT in the surgical management in these cases.
Material & Methods: We present the case of a 68-year-old male patient who suffers an assault with a knife in the street presenting a wound in his left forearm, among others. He underwent surgery in another center by suturing the myotendinous section of the common extensor tendon without incidence.
Two months later the patient came to our clinic presenting mobility deficit at the level of fingers and wrist and absence of palpable contraction distally.
A Magnetic Resonance Imaging (MRI) was performed showing section of the extensor digitorum, extensor carpi ulnaris and extensor digiti minimi, with a retraction of 6.8 cm, 5 cm and 6.5 cm respectively. An electromyography (EMG) was also performed, showing section of the sensory branch of the radial nerve, with no alterations at the motor level.
It was decided to perform revision surgery under WALANT.
Results: Through an approach by enlargement of the wound surgical revision was performed. Thanks to the use of WALANT we were able to count on the patient's participation. The viability of other structures was also checked.
An autologous peroneal tendon graft was used to repair the defect due to the retraction. The viability of our suture was verified live by the voluntary muscle contraction performed by the patient.
Five months after the surgery, the patient's hand function was practically normal, obtaining 0^{o} of extension of the metacarpophalangeal joint in the 3rd and 4th finger and -10^{o} in the 5th finger, as well as an ulnar deviation of 30^{o}.
To this day our patient has no pain or limitations in his daily life, as well as a return to his usual work activity.
Discussion: Any cut in the upper limb should never be underestimated. Failure to correctly assess and address tendon damage at the initial presentation in this type of injuries can lead to delayed diagnosis, suboptimal outcomes, and the need for revision surgery. A detailed evaluation of the injury site is crucial to identify the extent of damage, especially in cases involving complex or deep wounds.
WALANT is a great advantage in this type of surgery, allowing us to perform an intraoperative motor assessment without the use of sedation. It has been shown to be a safe and effective form of anesthesia with lower rates of operative time and postoperative pain.

A-0856 EFFECTIVENESS OF SPLINTS ON PAIN AND FUNCTION FOR 1ST CARPOMATECARPAL OSTEOARTHRITIS- REVIEWING THE CURRENT EVIDENCE

Haya Nasser, Hisham Arabkaabiye
Arab American University- AAU

Introduction: The 1st CMC osteoarthritis (OA), is a common degenerative condition, affecting 35.8% of the population, the second common joint in hand to have osteoarthritis. It's causes pain and limits the hand function leading to functional disability.
Aim: To investigate if splinting of the 1st carpometacarpal joint osteoarthritis (1st CMC OA), can reduce pain and improve hand function, and to critically appraise the current evidence.
Material & Methods: We searched the CINHAL and the Medline using the Ebsco host. Only systematic reviews and meta-analysis directly related to the main topic were included, and the data gathered and analyzed after consensus were made between the authors. The included studies, went under evaluation, including risk of bias, we took into consideration the different kinds of splints, the mean time frame of splint use, and each splint effectiveness on pain and function.
Results: splints shown to reduce pain levels, evidence of splint use is week, there is a need of higher quality RCT's, with paying attention to specific considerations
Conclusions: in our paper, we searched and evaluated the evidence on splint use in people with 1st carpometacarpal osteoarthritis, in terms of pain and function. Thought the current evidence supports splint use mainly for pain reduction and pain control and not necessary for functional improvement, also the evidence is of low risk of bias, but still, it's a week and of low quality, as researches suggests there is a need for higher quality RCTs. Mainly in terms of controlling the groups, the lack of long term follow up and the lack of standardized assessment battery for the population of 1st carpometacarpal osteoarthritis.

A-0857 FACTORS ASSOCIATED WITH NON-RESPONSE TO PATIENT-REPORTED OUTCOME MEASURES: AN UMBRELLA REVIEW AND META-ANALYSIS

Sebastiaan Peters[1,2,3], Joene Rutten[1], Yara van Kooij[1,2,3], Ruud W Selles[1], Harm Slijper[1,2], Robbert M Wouters[1]
[1]Erasmus MC - University Medical Center, Rotterdam, The Netherlands; [2]Xpert Clinics, Eindhoven, The Netherlands; [3]Xpert Handtherapie, Utrecht, The Netherlands

Introduction: Routinely collecting patient-reported outcome measures (PROMs) is an important aspect of modern value-based healthcare. Using PROMs in daily clinical care can enhance care delivery, shared decision-making, and progress monitoring (e.g., through clinician dashboards), ultimately improving outcomes, patient experiences, and tailored treatment. However, for PROMs to be valuable, they must first be completed —an essential yet obvious step to ensure their usefulness in clinical care. Understanding the factors associated with non-response to digitally collected PROMs is crucial to improving compliance with targeted interventions. However, there is currently no clear overview of factors associated with non-response.
Aim: This study investigated factors associated with non-response to digitally collected PROMs.
Material & Methods: We performed a systematic review of systematic reviews. An electronic search was conducted across five databases (MEDLINE, Embase, Web of Science, Cochrane Central Register of Controlled Trials, and Epistemonikos). Two independent reviewers screened the articles and extracted the data. The A Measurement Tool to Assess Systematic Reviews (AMSTAR) was used to assess the risk of bias in the included studies. We used the risk of bias score in a predefined best-

evidence synthesis to determine the level of evidence (i.e., strong, moderate, insufficient, or inconsistent). In addition, we extracted all factors identified (and corresponding odds ratios if available) to create a complete list of factors influencing non-response and performed a meta-analysis.
Results: We included six SRs. Three SRs only examined factors influencing non-response to digitally collected PROMs, while the other three also examined non-response to nondigitally collected PROMs. There was strong evidence that visual impairments and lower PROM quality were associated with higher non-response. In contrast, good system usability was associated with lower non-response. There was moderate evidence that language barriers, fewer health literacy, loss of grip strength, less technological experience, and overload or overlapping PROM questions were associated with higher non-response. In addition, there was also moderate evidence that automatic reminders and higher patient self-confidence and control in managing their health were associated with lower non-response. Furthermore, there was strong and moderate evidence that, respectively, employment status and depression were not associated with non-response, and there were inconsistent findings for the association of sex, age, education level, and symptom severity with non-response
Conclusions: Non-response to digitally collected PROMs is multidimensional and determined by a range of factors, including sociodemographic characteristics, physical health, psychosocial status, PROM characteristics, technological factors, treatment characteristics, and external influences. This umbrella review provides a generalizable, comprehensive overview of these factors to guide the development of targeted interventions for many healthcare settings (such as hand surgery) to improve PROM response rates and enhance value-based healthcare. Future research may focus on interventions that effectively improve response rates within hand-surgical healthcare. Potential interventions may include PROM item reduction, personalized reminders, overcoming language barriers, and an improved user interface for patients with, for instance, lower digital experience or visual impairments.

A-0858 A JAMES LIND PRIORITY SETTING PARTNERSHIP TO ESTABLISH RESEARCH PRIORIES IN ADULT TRAUMATIC BRACHIAL PLEXUS INJURY

Hazel Brown[1,2], Tom Quick[1,3,4], TBP JLA PSP steering group
[1]Centre for nerve engineering, UCL, London, UK; [2]Peripheral nerve Injury unit, Royal National orthopaedic hospital, London, UK; [3]Southmead hospital, Bristol, UK; [4]Musculoskeletal research unit, University of Bristol, Bristol, UK

Introduction: Traumatic Brachial Plexus Injuries (TBPI) are rare but associated with significant, lifelong loss of function in the upper limb. There are no agreed priorities for research to improve outcomes for patients.
Aim: To agree a 'Top 10' research priorities in TBPI through an academic process of priority setting.
Material & Methods: The James Lind Alliance (JLA) is a body linked to the UK National insatiate of Health research (NIHR) and facilitates a process of priority setting partnerships with expert patients, caregivers, and clinicians to direct future research direction.
A two year process was undertaken: An initial survey of 154 respondents (61% patients and/or caregivers, 39% clinicians) generated 704 questions. These were assessed, grouped and combined to create 68 summary question or 'uncertainties'. An evidence check of these uncertainties identified 3 of these as having been already answered by existing research; these were removed from the list. The next stage was an interim prioritisation survey, this attracted 79 respondents, (51% patients and/or caregivers, 49% clinicians) which asked respondents to choose their top ten from the 65 summary questions. In a final in person day-long workshop patients (n=9), caregivers (n=2), and clinicians (n=11) discussed and ranked the top 22 questions from the interim survey to identify the Top 10 TBPI research priorities.
Results: The Top 10 priorities highlight a need for improvements in all aspects of the care pathway including: psychological

support, physical therapies, assessments and surgical outcomes. In addition, scientific and engineering advances such as ways to enhance nerve regeneration, pharmacology and the development of robotics were also seen as important
Conclusions: These results will inform researchers and funding bodies about the top 10 priorities for patients, caregivers, and clinicians in directing the future research on TBPI.

A-0859 MEDIUM-TERM OUTCOMES OF TOTAL WRIST ARTHROPLASTY IN POST-TRAUMATIC ARTHRITIS OF THE WRIST: A CASE SERIES

Vasiliki Tsiampa, Eleni Pappa, Margarita Michaela Ampadiotaki, Ioannis Aggelos Trantos, Emmanouil Fandridis, Ioannis Ignatiadis
Upper Limb and Microsurgery Department, KAT General Hospital, Athens, Greece

Introduction: Post Traumatic Arthritis of the wrist can lead to severe functionally deteriorating pain which may lead to surgical treatment with total wrist arthroplasty. Various prosthetic designs, such as the Motec and Universal 2 implants, have been developed in order to manage successfully both SNAC and SLAC wrists.
Aim: In this retrospective case-series study we present our medium-term outcomes after total wrist arthroplasty of the wrist as managed in our department.
Material & Methods: 6 patients (5 males, 1 female) underwent total wrist arthroplasty by the same surgeon between January 2017 and January 2024. The outcomes data were collected in the form of Patient Rated Wrist Evaluation (PRWE) and Disabilities of the Arm, Shoulder and Hand (DASH) questionnaires at short term interval. The mean post-operative Range of Motion and grip strength were also studied. Kaplan-Meier survival analysis was also performed.
Results: The patients mean age was 61 years. At medium-term follow-up (mean 5.1 years), none of the total wrist arthroplasties performed needed revision or fusion, leading to a Kaplan Meier 5 year survival probability of 98.1%. There was a statistically significant improvement between pre-operative and post-operative PRWE and DASH scores. The post-operative Range of Motion and grip strength on the latest follow up were also statistically significantly better than the pre-operative. No patient suffered from dislocation or periprosthetic fracture. Only one patient suffered from deep infection.
Conclusions: Total Wrist Arthroplasty (TWA) is an effective and safe alternative to total wrist arthrodesis with comparable outcomes. Our series outcomes are satisfactory and in line with literature. This study shows that TWA provides satisfactory outcomes by decreasing pain and preserving range of motion in patients with post-traumatic arthritis of the wrist. However, despite excellent medium-term follow-up outcomes, longer term follow-up is needed in order to determine the rate of the implant failure and instability.

A-0860 COMPLEX DORSAL DISLOCATION OF THE METACARPOPHALANGEAL JOINT OF THE THUMB: A CASE REPORT OF OPEN REDUCTION THROUGH A DORSAL APPROACH

João Valadas da Silva[1], Joana Barreto[2], Bruno Morais[2]
[1]ULS Amadora / Sintra, Amadora; [2]ULS São José, Lisbon

Introduction: Complex dorsal dislocations of the metacarpophalangeal (MP) joint of the thumb are uncommon injuries that are not amenable to closed reduction.
Case: We present the case of a 33-year-old male, who presented to the emergency department after a hyperextension injury to his left thumb. The patient had a swollen, painful finger with deformity and radiographs revealed a dorsal MP

dislocation of the thumb. Closed reduction was attempted a few times without success and the patient was taken urgently to the operatory room. Under general anesthesia, we proceeded to the open reduction of the MP joint through a dorsal approach. The flexor tendon was interposed in the articulation. A gentle pressure was distally applied to distract the MP joint space and against the proximal phalanx to reduce the joint and the capsule was repaired. There were no other injuries and a stable reduction was obtained. After surgery, an early mobilization protocol was followed and the patient recovered joint mobility, with no pain, no instability and a similar grip strength to the contralateral hand.
Discussion: Although rarely, dorsal dislocations of the MP joint of the thumb sometimes need urgent open surgery when closed reduction is not possible, mainly because of the entrapment of the volar plate between the metacarpal bone and the proximal phalanx. Although there is some controversy between the preferred approach, surgery can be performed through a dorsal or volar incision. In this case, we opted for a dorsal approach because it offered great exposure, no risk of damage of the neurovascular structures and there was no need to split the volar plate. Postoperatively, there is debate over the period of immobilization as some authors recommend an early mobilization protocol (as early as 3 days), while others defend a varying period of immobilization. Either way, early treatment is the most important aspect in the management as the best results are seen when surgery is performed within the first day of injury.
Conclusions: Complex dorsal dislocations of the MP joints are uncommon and are often treated with an open surgical approach with good results. If open treatment of irreducible MP joint dislocations is performed in due course and early mobilization is advocated, full recovery and range of motion are very likely.

A-0861 RADIOTHERAPY IN DUPUYTREN'S DISEASE OF THE HAND: A FORGOTTEN MODALITY? A SURVEY OF THE BRITISH SOCIETY FOR SURGERY OF THE HAND CONSULTANTS

Prashanth D'sa, Kathryn Dayananda, Vasudev Shanbhag
Aneurin Bevan University Health Board, Newport, United Kingdom

Introduction: Management of Dupuytren's disease (DD) predominantly targets the correction of established flexion contractures. Radiotherapy (RT) for DD is not mainstream care but is emerging. Treatments targeting precontracture disease might be desirable in certain clinical scenarios.
Aim: To understand the current national practices surrounding radiotherapy for DD, which may aid in the development of local practices.
Material & Methods: An online Google survey questionnaire was distributed by the BSSH to its consultant members. Respondents were asked if they refer patients with DD for radiotherapy, and if yes, to whom?. Indications and patient inquiry experiences were also requested.
Results: We received 29 responses from 20 different hand units across the UK. Fifty-two percent (n=15) of respondents refer patients for RT. Referrals are directed to medical oncology in 93%. Only 10% of the hand units (n=2) have a formalised pathway for RT in DD. Ninety-three percent (n=14) refer patients in Tubiana stage 0, 40% (n=6) refer for diathesis/recurrence, and 20% (n=3) refer patients post-operatively. No respondents referred patients in Tubiana stage 2/3/4. Eighty-two percent (n=24) of consultants had experience with patients enquiring regarding RT use in DD.
Conclusions: This limited survey finds that patients do enquire regarding RT treatment for DD.
The treatment appears only to be offered in limited centres, predominantly for early-stage disease, diathesis, and recurrence cases.
Lack of high-level evidence and national guidance likely contributes to restrictive use.
We are unable to determine the extent this treatment is discussed with patients, but we hypothesise many do not routinely.

Further research and discussions at international societies are required to discuss how members feel this treatment is best utilised and to generate written pathways for its safe and consistent usage.

A-0863 TECHNIQUE MODIFICATION: 4-CORE INTRA-OSSEOUS ZONE 1 FLEXOR TENDONS REPAIR FOR TRAUMA AND DISTAL STAGE 2 TENDON RECONSTRUCTION

Jessica Lynch, Anna Rieman, Rini Vyas, Paul McArthur
Alder Hey Children's Hospital, UK

When performing a distal zone 1 tendon laceration repair or a 2nd stage tendon reconstruction it is necessary to attach directly to bone. This can be done using many techniques including a bone anchor, button or horizontal intra-osseous repair. In a standard tendon laceration repair it is accepted that increasing the number of core sutures from 2 to 4 increases the strength of the repair, however the above techniques for intra-osseous repair typically involve 2 core sutures and a single pass through the bone.
Aim: To demonstrate our 4-core modification to the intra-osseous tendon repair, demonstrate the geometry that influences the technique's success and discuss cases where the technique has been used in the paediatric population.
Material & Methods: Surgical Technique: Exposure is by surgical preference. The lateral margin of the distal phalanx is dissected to allow a 19g hypodermic needle, used as a cannulated drill to cross the transverse width of the bone at the level of the distal border of the tendon insertion. The loose end of a 3-0 prolene on a ½ circle, round bodied suture is passed through the core of the needle. The hypodermic needle is removed leaving the suture in-situ through the hole in the bone. The 1st hemi-tendon is repaired using a modified Kessler, the round bodied needle is then passed through the hole in the bone and the 2nd hemi-tendon is repaired. The suture has therefore passed through the bone twice and there are 4 core sutures in the distal tendon. The suture is tensioned to give good bony contact, and the knot is tied. The knot sits on the lateral margin of the phalanx, on the radial margin of ulnar digits and on the ulnar margin of radial digits.
Trigonometry: Using the formula to determine the length of a cord of a circle $PQ=2\sqrt{((r^{(2-)} d^{2}))}$ we calculated the maximum width of bone this technique is compatible with.
Results: We performed 3 cases: 2 distal traumatic zone 1 lacerations and one 2nd stage tendon reconstruction. The Maximum width of bone it is possible to pass a ½ circle 3-0 Prolene through without bending the needle is 8.7mm and this is with the 31mm Ethicon w8525 round bodied needle. The more commonly available 26mm w8522 equivalent can be passed through 7.8mm width of bone
Conclusions: A 4-core intra-osseous tendon repair is possible where the width of the distal phalanx at the insertion site is less than or equal to 8.7mm. The 3 patients on which the technique was used was done so without complication.

A-0867 MOTOR NERVE TRANSFER FOR THE SPASTIC UPPER EXTREMITY: A CASE SERIES

Izabela Blaszczyk, Per Jenmalm, Staffan Svenlin
Department of Diagnostic and Intervention, Hand and Plastic Surgery, Umeå University, Sweden

Motor nerve transfer (MNT) is a well-established surgical technique commonly used to restore function in paralyzed muscles following brachial plexus and peripheral nerve injuries. In recent years, MNT has also been successfully applied for functional reconstruction in the upper extremity of patients with tetraplegia following spinal cord injury.
For a MNT to be successful, certain conditions must be met: the donor nerve must innervate a functioning muscle with

preserved voluntary contraction (i.e., both upper and lower motor neurons are intact), and the recipient muscle must have preserved intra-muscular structure. The intra-muscle structure is maintained if the lower motor neuron is intact or if the time since the lower motor neuron injury is less than 12 months. Additionally, the distance between the donor and recipient nerve should allow for direct nerve adaptation without the need for a nerve graft.
The supinator nerve is the most used donor nerve, serving as an excellent motor donor for either the posterior interosseous nerve (PIN) or the anterior interosseous nerve (AIN). The PIN innervates the extensor muscles of the fingers, thumb, and wrist, while the AIN innervates the flexor muscles of the fingers and thumb.
In cases of spasticity, the necessary conditions for a successful MNT may still be present, enabling the restoration of function in extremities affected by stroke or other brain injuries. To date, no one has published results on the use of MNT in patients with spasticity in the upper extremity. Therefore, we would like to share our experiences and present the results of using MNT in patients with spasticity in the upper extremity.
In this case series, we present the outcomes of using supinator nerve transfer to restore either finger and thumb extension or finger and thumb flexion in the spastic hands of stroke patients.

A-0868 AN IMPORTANT ALTERNATIVE IN FINGER RECONSTRUCTION; FREE TENAR FLAP

Onur Zengin, Ahmet Furkan Dinçer, Percin Karakol, Muhammet Yasin Babacan, İbrahim Enes Aydoğan, Zeki Çelik
SBU Başakşehir Çam and Sakura City Hospital, Istanbul

Entrance: The free tenar flap, which provides a durable and glabrous tissue, is an important alternative and option for repairing defects on the volar surface. The flap is planned as a fasciocutaneous flap over the superficial branch of the radial artery. This artery branches approximately 1 cm proximal to the wrist crease. It has a diameter of approximately 1.5 mm and is suitable for digital artery anastamosis. The perforators extending from this artery to the skin are especially concentrated around the tubercle of the scaphoid. They can be used sensory via various nerves such as the lateral antebrachial cutaneous nerve, the superficial sensory branch of the radial nerve, and the palmar cutaneous branch of the median nerve. Donor site morbidity is also low, making the flap an important alternative.
Material - Method: Between February 2023 and August 2023, 6 cases who underwent free tenar flap for finger volar facial defects at our clinic were included in the study. The mean age was 35 years. There were no additional finger trauma or life-threatening trauma in the cases. All 6 cases were applied to defects secondary to traumatic amputation. In 4 of these cases, there were defects in the thumb, one in the middle finger and the other in the little finger. The average size of the defects was 30x20 mm. Free tenar flap operation was completed in all cases under infraclavicular regional anesthesia. The average size of the designed flaps was 40x25 mm. In the surgical operation, the artery and concomitant vein of the pedicle were anastomosed to the recipient site under microscope guidance. In flap follow-up, acute venous insufficiency developed in 1 case in the acute period and the flap was saved by urgent revision. Partial necrosis developed in 1 case in the early period and surgical healing was left secondary. In 4 cases, flap circulation was stable. There were no late complications.
Discussion and Conclusion: Local or interpolation flaps are also used in cases where functional units are exposed in volar defects. However, in such cases, local flaps are suitable for use in smaller defects, while interpolation flaps may lead to secondary surgery and stiffness in the joints. In free flap options, some flaps are primarily suitable for the skin compatible with the finger's own functional unit and have low donor site morbidity. Considering all these processes, the free tenar flap should be considered as an important, useful and practical alternative in volar defects because it is relatively easy to dissect, has low donor site morbidity, provides a glabrous tissue and provides sensory innervation according to the location.

A-0869 GRAFTLESS REPAIR OF COMPLEX SYNDACTYLY USING THE "STINGRAY" LOCAL FLAP: A CASE SERIES

Rini Vyas, Molly Jakeman, Maria Kelly, Jessica Lynch, Paul McArthur
[1]Alder Hey Children's Hospital, Liverpool, U.K.; [2]The Hospital for Sick Children, Toronto, Canada

Introduction: Complex acrosyndactyly poses a reconstructive challenge in the Apert hand. Full-thickness skin grafts (FTSGs) are commonly used to overcome the skin deficit in syndactyly release, but various local flaps have been described as alternatives to obviate the need for a distant donor site.
Aim: This study reviews the technique and outcomes of the novel "stingray" flap in Apert syndactyly at a tertiary Paediatric Hand Surgery Unit in the U.K.
Material & Methods: 21 patients with Apert syndrome were managed by our unit between January 1997 and January 2024. Medical records, clinical photographs and radiographic images were retrospectively analysed. 57.1% of hands were Upton type 1; 23.8% were Upton type 2; and 19.0% were Upton type 3. Stingray flaps were designed as a dorsal hand proximally based local flap, with most scars placed in the interdigit space and direct closure of the donor site.
Results: 59.1% of all syndactyly releases were performed using stingray flaps, increasing to 65.5% from the year 2000 onwards, without any instances of flap failure or donor site complications. Web spaces revisions were required in 16.7% of stingray flap syndactyly releases, compared to 34.5% of FTSG syndactyly releases. Of all revision operations performed, 70% were performed using stingray flaps and none required a second revision. Three patients completed all of their staged syndactyly operations using stingray flaps alone without revision procedures, all achieving 4 or 5 digit hands
Conclusions: The stingray local flap is a graftless syndactyly technique that is useful in both primary and revision staged Apert hand operations. By recruiting dorsal hand skin, the stingray flap results in an aesthetic and functional web space release that has reduced the need for skin grafts and web space revisions in our cohort.

A-0871 GROUNDBREAKING METHOD FOR DETECTING FINGER VASCULAR INJURIES REQUIRING URGENT REPAIR USING HANDHELD INFRARED THERMOGRAPHY CAMERA

Siu Cheong Jeffrey Justin Koo, Hiu Hong Wong, Siu Ling Szeto, Hoi Yan Lam, Sheung Wai Law
Alice Ho Miu Ling Nethersole Hospital, Hong Kong SAR

Introduction: Current assessment of finger vascular injuries requires surgeon's experience and is subjective.
Infrared thermography camera detects temperature; thus its image can be a marker for finger blood flow. No research has been done to use it in identification of finger injuries necessitating revascularization.
Aim: To evaluate accuracy of handheld infrared thermography camera as adjunct to standard clinical methods in assessing the need for urgent revascularization.
Material & Methods: Injured fingers were examined regarding colour and capillary return. Then digital thermogram was taken using thermography camera. Condition of digital artery was assessed during subsequent surgical repair and findings were taken as gold standard.
Results: From 1st December 2022 to May 31, 2024, 78 patients with 83 traumatic finger injury attended Alice Ho Miu Ling Nethersole Hospital were recruited, with mean age of 47, and male-to-female ratio of 6:1. 4 fingers required urgent revascularization. Thermography camera successfully detected all of them while clinical assessment missed one. It has 100% sensitivity, specificity, positive/ negative predictive value, diagnostic accuracy, and best diagnostic agreement with gold standard. In fingers with intact vascular status, mean variation of temperature across injury site was 0.2 (range 0-2.2 , σ 0.58), corresponding to same colour tone. In fingers requiring revascularization, mean temperature difference

across injury site was 7.5 (range 6.4-8.12 , σ 0.68), corresponding to change in colour tone from white/ red to green/ blue Conclusions: Handheld infrared thermography camera is accurate, objective, low-cost, user-friendly, and non-invasive to help surgeon assess severe finger vascular injury and differentiate who needs urgent revascularization surgery.

A-0872 3D SEGEMENTATION IN DUPUYTREN'S CONTRACTURE

Martin Byström[1,2], Joakim Strömberg[1,2], Katleen Libberecht[1,2]
[1]Sahlgrenska University Hospital, Gothenburg, Sweden; [2]Sahlgrenska Academy, University of Gothenburg, Sweden

Introduction: Our knowledge of the anatomy in Dupuytren's disease is mainly derived from anatomical dissections and observations during open surgery. Although much has been learned this way, both methods are inevitably invasive and distort the tissue being studied. With Magnetic resonance imaging (MRI) it is possible to produce high-quality images of the soft tissue in the hand. The use of 3D-rendering techniques in hand surgery has gained a lot of attention in recent years. The primary focus for 3D techniques has been on skeletal imaging from computer tomography, but the techniques can be applied to MRI as well
Aim: To develop a method to visualize the cords and noduli in hands affected by Dupuytren's contracture, and furthermore, measure changes in volume before and after percutaneous needle fasciotomy (PNF)
Material & Methods: Eight patients scheduled for percutaneous needle fasciotomy underwent MRI at three time points: preoperatively, one month postoperatively, and one year postoperatively.
Subsequently, the MRI data were processed using a 3D segmentation software to generate three-dimensional images. Measurements of the noduli were obtained from 3D images to quantify the outcomes of the surgical intervention.
Results: All treatments were successful, defined as passive contracture < 5 ° measured immediately after treatment. One patient failed to arrive at the one-year examination, aside from that, data from all other time points were collected. It was possible to provide visualization of the cords and noduli in all MRI examinations. All patients had at least one nodule present and the volume was measured before and one year after treatment. In patients with multiple noduli the largest was selected for examination. There was a significant decrease ($p< 0.05$) in the mean volume of the noduli from 644 m3 pretreatment to 350 mm3 at one year
Conclusions: Magnetic Resonance Imaging (MRI) combined with 3D rendering software provides visualization of Dupuytren's contracture. Furthermore, it facilitates the acquisition of precise measurements. In the examined patients the volume of the major nodule significantly decreased after PNF. The combination of MRI and 3D rendering software appears to be a promising research technique for Dupuytren's contracture.

A-0873 SURGICAL TREATMENT OF SCAPHOLUNATE INSTABILITY IN DORSAL INTERCALATED SEGMENT INSTABILITY (DISI)

Mehmet Albayrak, Yasin Canbaz, Osman Şamil Sevindik, Kurtuluş Öz, Yunus Ertaş
Başakşehir Çam ve Sakura City Hospital Plastic Reconstructive and Aesthetic Surgery Department, İstanbul, Turkey

Introduction: Scapholunate instability is the most common type of carpal instability and the leading cause of post-traumatic wrist osteoarthritis. The primary etiological factors include excessive dorsiflexion of the wrist and pronation of the forearm. This condition is characterized by persistent dorsolateral wrist pain and difficulty in gripping movements. In this case, we aimed to restore the anatomical alignment of the bones, improve joint mobility, and reduce pain through surgical intervention in a patient presenting with SL dissociation.

Materials and Methods: This study evaluated the surgical treatment and follow-up of a patient diagnosed with scapholunate dissociation (DISI deformity) who presented to our clinic in September 2024 with severe pain and restricted joint motion.
Results: A 57-year-old male patient presented with complaints of wrist pain persisting for four months. On physical examination, significant tenderness was observed on palpation of the dorsolateral wrist. The patient exhibited a marked loss of wrist extension and radial deviation, as well as partial restriction in flexion and ulnar deviation. Flexion of all fingers was intact, but hyperextension was limited due to pain, and motor weakness was noted. Sensory examination revealed numbness in all fingers. Preoperative AP and lateral radiographs showed a 3-mm dissociation between the scaphoid and lunate bones (Terry-Thomas sign). The scaphoid was in a flexed position, while the lunate was dorsally extended.
During surgery, dissociation in the scapholunate region was observed. The scaphoid and lunate bones were anatomically fixed using two K-wires. An additional oblique K-wire was employed to fix the scaphoid and capitate bones. Fixation was reinforced with anchor sutures placed in the scaphoid and lunate bones. The procedure concluded with the repair of the remnant ligament, joint capsule, and extensor retinaculum. The postoperative course was uneventful, and the patient was discharged. At follow-up, K-wires were removed after eight weeks of splinting, and the patient was referred for early physiotherapy.
Discussion: DISI deformity is a condition characterized by significant loss of hand function, which can rapidly progress to osteoarthritis if diagnosis and treatment are delayed. Diagnosis is based on a combination of physical examination and imaging findings. Early surgical intervention has shown to yield favorable outcomes. In this study, we emphasize the importance of hand surgery techniques within the scope of plastic surgery, presenting the successful results of surgical treatment and follow-up in this case. Long-term observations indicated that patients could return to their professional activities.
Conclusions: Although surgical treatment for scapholunate instability associated with DISI deformity involves technically demanding procedures, it is a crucial therapeutic modality with successful long-term outcomes. This approach can effectively prevent severe bone and joint deformities. Conducting similar studies with larger patient cohorts will contribute significantly to the literature.
Keywords: DISI deformity, scapholunate dissociation, osteoarthritis

A-0874 BICEPS BRACHII IN THE SPASTIC ARM – VILLAIN OR ANTI-HERO? EXPANDING OUR UNDERSTANDING OF THE BICEPS BRACHII USING BIOMECHANICAL COMPUTATIONAL MODELLING TO PREDICT OPTIMIZATION OF SUPINATION IN PATIENTS WITH FOREARM SPASTICITY

S. Abas[2], Ya Lefgoum[1], E Chadwick[1], S Kondi[3], T Murugesan[3], SJ Pickard[2]
[1]Department of Engineering, University of Aberdeen, Aberdeen, Scotland, UK; [2]Department of Hand and Upper Limb Surgery, The Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, UK; [3]Royal Shrewsbury Hospital, Shrewsbury and Telford Hospitals NHS FT, Shrewsbury, UK

Introduction: In patients with hemiplegia affecting the upper limbs, balancing prono-supination with flexion remains a challenge. Loss of supination represents a significant functional limitation. Conventional strategies to improve supination involve weakening the biceps brachii, due to its role predominantly as an elbow flexor. However, if the 2 heads biceps brachii can be considered as having independent functions, a shift in strategy from weakening biceps altogether, to transferring its function to pure supination, could improve functional outcomes in the hemiplegic patient with forearm spasticity.
Aims: The aim of this project was to enhance our understanding, using computational modelling, of the anatomical relationship of the 2 heads of biceps brachii. We also aimed to predict whether changing the anatomical insertion of the

short head of biceps (SHB), which is considered the elbow flexor, to a location closer to the insertion of the long head of biceps (LHB) would increase the moment arm for forearm supination.
Materials and Methods: Computational analysis was carried out using OpenSim 4.5, an open-source software used for musculoskeletal modelling and simulation. The base model used in this study is the das3_simplified.osim model (University of Aberdeen) which represented the functional anatomy of the upper limb. The model was developed to include a more anatomically accurate description of the biceps brachii, with specific reference to its dual-footprint for insertion (of both SHB and LHB) on the proximal radius. Data to inform the model was sourced from anatomical literature and a cadaver-based biomechanical model (Veeger et al.). The resultant model was then modified, and simulation performed to evaluate different insertion points and resultant moment arm for supination, to find the optimal supination moment. Simulations were run to assess the impact of these modifications on postulated muscle function, joint movement and arm function.
Results: The model simulating tendon transfer (i.e. transferring the SHB to a footprint closer to the LHB) increased the supination moment arm for both heads of biceps brachii. This indicates that the SHB transfer in this mode can potentially generate more power in supination, by aligning its force vector more closely to the rotational axis of the forearm. In addition to this, the tendon transfer model demonstrated a reduced flexion moment arm, which supports the rationale behind conventional techniques that weakened flexion. Transferring SBH shifts its line of pull further from the flexion axis.
Conclusion: Considering the 2 heads of biceps brachii a having independent functions has significant implications for planning surgical interventions in patients with forearm spasticity. Rather than lengthening the biceps brachii, which conventionally weakens flexion, transferring the SHB may tip the balance of prono-supination/flexion towards supination whilst reducing flexor tone, and hence improve outcomes in this group of patients.

A-0875 EVALUATING TREATMENT OUTCOMES COMBINING CORTICOSTEROID INJECTION AND SPLINT FOR STENOSING TENOSYNOVITIS

E Roche[1], B O'Ceallaigh[2], Edel Siney[3], Stephen Keelan[1], Kenneth M Joyce[1]
[1]Dept of Plastic & Reconstructive Surgery, Galway University Hospital, Galway, Ireland; [2]Dept of Physiotherapy, Galway University Hospital, Galway, Ireland; [3]Dept of Occupational therapy, Galway University Hospital, Galway, Ireland

Introduction: Stenosing tenosynovitis (STS), commonly known as trigger finger, is characterized by pain and locking of the affected digit. There is limited evidence evaluating combined non-surgical treatments. The purpose of this study was to assess the efficacy of combined splinting and corticosteroid injection for management of STS. We further aimed to identify factors correlated with patients failing to respond to nonsurgical treatments.
Aim: To evaluate treatment outcomes in combining corticosteroid injection and splint for stenosing tenosynovitis and to create an appropriate local treatment pathway.
Material & Methods: Prospective data were collected on patients diagnosed with STS between January 2022 and September 2024. Patients were fitted with a customised metacarpophalangeal (MCP) blocking orthosis limiting flexor tendon excursion. Splints were worn day and night for six weeks. Patients who received an injection but have not attended their follow-up appointment were excluded. Patients not responding to a first corticosteroid injection were offered a second injection. Those failing second injections were then offered surgical release of A1 pulley. We examined the effect of gender, comorbidities, Quinnell grade, duration of symptoms on treatment efficacy, using univariate analysis. Statistical significance was determined at $P<0.05$.
Results: In total 68 trigger digits in 46 patients were analysed. The mean age of patients was 60.6 years (range 32-92 years). The mean duration of symptoms was 17 months (range 3-48 months). The majority of patients presents with STS

Quinnell Grade III (70.6%, n=48), followed by Quinnell Grade II (27.9%, n=19). Most cases were primary STS (88%, n=60) while 8 patients were recurrent cases of STS, at presentation to our service. The mean time from referral to assessment was 9.3 months (range 1-24 months) while mean follow up time was 5.8 months (range 2-11). The success rate of combined corticosteroid and splinting was 88.2%. Five trigger digits went on to have surgical A1 pulley release. One digit did not respond to steroid injection but refused surgery. The failure rate with combined injection and splinting in patients with symptoms <12 months was not significantly less than those with symptoms greater than 12 months (7.4% vs 19.2%. P=0.25). Other factors such as gender, Quinnell grade, Diabetes mellitus, rheumatoid arthritis, primary versus recurrent disease had no significant impact on treatment efficacy.
Conclusions: The combination of splinting and corticosteroid injection is effective in treating patients with STS. Customised MCP joint blocking splint is well-tolerated and acts synergistically with corticosteroid injection. The approach of combining these modalities results in few patients requiring surgical intervention, and should be the preferred initial strategy for his condition.

A-0876 FREE TOE PULP TRANSFER IN FINGERTIP INJURIES

Percin Karakol, Hüseyin Ulaş, Oguzhan Tekin, Ali Dönmez, Zeki Çelik, Yasin Canbaz
Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, Istanbul, Türkiye

Introduction: Fingertip injuries are common, and they are classified using the Tamai classification. Zone 1 injuries involve the area from the fingertip to the nail base, while zone 2 involves the area from the nail base to the DIP joint. The primary goals of reconstruction are restoring the finger pulp contour and providing sensory innervation, which is crucial for the first three fingers. Reconstruction techniques include grafts, local flaps, and microsurgery. Flaps are preferred when there is exposed tendon or bone. This study aims to share our experience with free toe pulp flap transfer for fingertip defects.
Materials and Methods: This retrospective study evaluates five patients treated with free toe pulp transfer for fingertip defects between February 2023 and June 2024. The study included five male patients, aged 23-44 years. The tissue defects involved the right hand thumb pulp in one patient, the left hand middle finger pulp in two patients, and the right hand ring finger pulp in two patients. The thumb injury patient also had a distal phalanx fracture. The trauma etiology was crush injury in three patients and laceration in two. The average hospital stay was 5-21 days. One patient had hypertension, while the others had no chronic illnesses. Four patients were right-handed, and one was left-handed. The donor site was the fibular side of the first toe in three patients and the tibial side of the second toe in two. One middle finger defect patient also had a ring finger injury. The donor site was primarily sutured in four patients, and one required a full-thickness skin graft for closure. No donor site complications occurred. One flap was lost, and the defect was closed with a skin graft. No long-term complications were noted in the remaining patients.
Discussion: Finger reconstruction should aim to improve functional outcomes. Free toe pulp transfer offers several advantages, including glabrous skin that matches the finger's color and texture, higher healing potential compared to other sensory flaps, and the ability to include nail components in cases of nail bed injuries. However, it also has drawbacks, such as difficult dissection due to small vessels, long surgery time, potential donor site scarring, and the need for a graft to close the donor site.
Conclusion: Free neurovascular toe pulp flap transfer should be considered a valuable option for fingertip reconstruction due to its anatomical similarity to digital pulp, lack of need for finger immobilization, and ability to provide optimal functional and aesthetic outcomes.
Keywords: flap, pulp, reconstruction

A-0878 MANAGEMENT OF HIGH PRESSURE INJECTION INJURY TO THE FINGER WITH AN EARLY EXTENSIVE, DUPUYTREN-SURGERY-LIKE DEBRIDEMENT

Iva Neshkova, Nadine Schmid, Daniel Kachnov
CHL Centre Hospitalier de Luxembourg, Luxembourg, Luxembourg

High pressure injection injuries of the hand are a rare condition that can cause extensive soft tissue damage with poor functional outcome and have a high amputation rate. The initial presentation could be misleading due to a usually small entry wound.
Review of the literature advocates early debridement to reduce the toxicity of the injected substance and the risk of compartment syndrome and secondary infection. Catheter irrigation was suggested as an alternative for water paint injections only. Late presentation with necrosis is not uncommon and could require a flap coverage or lead to amputation.
We present a case of a 22 old painter, who sustained a high pressure injection injury to his index finger of the non-dominant left hand with a paint gun. A 5 mm wound was visible palmar, just distal to the PIP joint. X-ray showed a wide spread of radio opaque material from the distal phalanx up to the base of the proximal phalanx and along the neuro-vascular bundles. An immediate exploration showed paint incorporated diffuse in the soft tissue. We decided to perform a radical Dupuytren-surgery-like debridement. Second look surgery was performed 2 days later. Broad-spectrum antibiotics were administered for 7 days. Wound healing was obtained without complications 2 weeks postoperative. Early passive and active physiotherapy was started.
We can report a very good result 14 months after injury. The patient returned to his previous occupation and had no impact on activities of daily living. The patient gained nearly full range of motion, except a minimal extension deficit of the PIP joint of 15 degrees. No residual swelling, no sensation deficit, no neuropathic pain, no CRPS could be reported. He presented cold intolerance and had a moderate reduction of the grip strength.
Management of high pressure injection injuries of the hand remains a challenge due to initially difficult estimation of the extent of the tissue damage. Early recognition and debridement are crucial. We can report a very good functional result after an immediate radical debridement in a Dupuytren-surgery-manner and can recommend this approach, especially when the injected substance is not well delimitated.

A-0879 RETURN TO WORK FOLLOWING OPERATIVE TREATMENT OF PERILUNATE LUXATION AND FRACTURES

Frauke Deneken, Laura Kock, Heinz-Herbert Homann
Dept. of Hand and Plastic Surgery, BG-KLinik, Duisburg, Germany

Introduction: The aim of this study with retrospective data collection and prospective outcome measurement was to determine the work-related outcome after treatment of perilunate dislocations and dislocation fractures. The primary aim was to identify occupational-functional aspects. Particular attention was paid to the reduction in earning capacity and satisfaction with the treatment in relation to everyday working life.
Methods: The preparatory data collection for the study was carried out by the HIS and included the cases recorded at our clinic in the period from 2011-2020 that were treated for a perilunate dislocation or dislocation fracture. 45 data sets were recorded. Of the patients identified, 16 agreed to participate in the follow-up examination as part of the study. Of the remaining 29 patients, relevant points (diagnosis, therapy, period of accident and therapy, course of accident, occupation, range of motion and postoperative rehabilitation measures) were included in the evaluation on the basis of HIS-relevant data.

The participants were physically examined, their range of motion, grip strength tests, DASH score, Krimmer score, EFL test, SF12 questionnaire and patient satisfaction were recorded. The statistical analysis was purely descriptive using Microsoft Excel.
Results and conclusion: Overall, the study showed that the work-related outcome after perilunate dislocations and dislocation fractures is very satisfactory. Of all usable data, the postoperative ability to work was 100%. In only one case was retraining necessary. Nine patients reported a 27.5-30% reduction in earning capacity as a result of the injury. The patients were subjectively very satisfied with the treatment with 92.4 % on the visual analog scale.
In summary, it can be seen that although the injury pattern in perilunate dislocations and dislocation fractures is very severe, patients are able to resume adequate occupational activity and are also highly satisfied with the treatment outcome in everyday life thanks to rapid diagnosis and treatment as well as subsequent physiotherapeutic measures.

A-0880 VERSATILITY OF FREE FIBULA TRANSFER IN FOREARM RECONSTRUCTION AFTER SEPTIC COMPLICATIONS

Heinz Herbert Homann, Frauke Deneken
Department of Hand and Plastic Surgery, BG-Klinik Duisburg, Germany

Introduction: Septic complications following open reduction and fixation in forearm fracture leads often to long term problems because simple bone transplantation is not sufficient
Aim: To analyze the key steps in finding indication for free fibula replacement of the necrotic septic bone and to find out the most important technical steps in reconstruction of the function
Material & Methods: we analyzed 12 reconstruction procedures of the forearm, 8 ulna reconstruction and 4 radial reconstruction by using a free fibula. There were 8 men and four female, age ranges from 16 to 46 years. Mean time between forearm reconstruction and injury was 11,3 month.
Results: 8 of the 12 patients showed a complete bone healing following the free fibula transfer after a mean time of 13 weeks. 3 patients an additional bone graft and a minor revision of the osteosnthesis was done, healing rate in this group was prolonged to 16 weeks. 1 failure was noted after the microsurgical anastomoses failed even after revision. This transplant did not heal at both ends of the fibula.
Conclusions: Free fibula transfer with micorsurgical anastomoses of both, arterial and venous vessels, is a safe method for reconstruction of the forearm. There are some crucial intraoperative steps to take, to achieve a good function for rotation, e.g. the outline of the osteoszntheses and the plate position. If masquelet did not bring the right result, what we saw frequently in ulna reconstruction, the free fibula should be kept in mind early.

A-0881 WRIST VOLAR-ULNAR APPROACH IN ISOLATED VOLAR RIM LUNATE FACET FRACTURE OF DISTAL RADIUS. AN ALTERNATIVE SAFE APPROACH, CASE REPORT

João Jesus Silva, António Serrano, Nuno Matos Silva, Afonso Nave, Sara Raposo, Rui Barbeiro Gonçalves
Serviço de Ortopedia, Hospital S. Francisco Xavier, ULSLO, Lisboa, Portugal

Introduction: Isolated fracture of the volar-ulnar corner is a rare pattern of distal radius fracture. Acting as the keystone for carpus support, anatomic reduction and stable fixation of this fragment is of utmost importance to prevent carpal subluxation.
Most distal radius fractures are treated using the volar henry approach, which may limit the exposure of the volar-ulnar

articular rim of the distal radius. Furthermore, this approach requires forceful retraction of the flexor tendons and median nerve and also makes fixation technically challenging due to poor visualization.
Aim: We aim to present a clinical case of an isolated volar lunate facet fragment submitted to open reduction and internal fixation through a volar-ulnar Approach.
Material & Methods: Sixty-four-year-old patient, with medical history of high blood pressure and diabetes, presented with trauma of the left wrist after a fall from height. Initial radiographs and CT scan revealed an isolated volar rim fracture of the lunate facet of the distal radius. The patient was submitted to open reduction and internal fixation through a volar-ulnar approach. A 5cm longitudinal incision was made, starting at the distal volar crease and extended proximally, at the midpoint between the flexor carpi ulnaris (FCU) and the palmaris longus. The ulnar nerve and artery were identified more superficially and retracted ulnarly with the FCU, while the flexor tendons and median nerve were retracted radially. After direct reduction and provisional K wire fixation, articular reduction was assessed through arthroscopy using standard dorsal portals. Fracture was definitely fixed with a pre-contoured L-shape plate. One k-wire K wire was left subcutaneously for additional stability, and latter removed in clinic.
Results: A dorsal splint was used for the initial pain control and soft tissue rest. The K-wire was removed and wrist passive and active ROM exercises were started at 2 weeks. Standard distal radius frature rehabilitation protocol was followed. Fracture union and maintained carpal alignment was observed on followup radiograph and the patience showed good functional scores at 6 and 12 weeks post-operatively
Conclusions: The volar ulnar approach is a safe approach for treatment of isolated volar rim lunate facet fracture. It allows better exposure of the fragment and easier access for fracture fixation than the conventional distal radius Henry approach. Thus, this approach should be considered as a safe alternative option for treatment of this type of fractures.

A-0883 THE USE OF RCPI IN YOUNG ACTIVE PATIENTS: DOES SPARING THE PROXIMAL POLE OF THE CAPITATE LEAD TO BETTER OUTCOMES?

Lorenzo Rocchi, Rocco De Vitis, Camillo Fulchignoni, Silvia Pietramala
Policlinico Universitario A. Gemelli, Rome, Italy

Introduction: Proximal row carpectomy (PRC) is a well-established and effective surgical technique for addressing various painful and degenerative wrist conditions, provided the proximal pole of the capitate and the lunate fossa of the radius are preserved. This approach is particularly effective for alleviating pain and improving wrist mobility, although it is less successful in restoring grip strength. In recent years, the advent of pyrocarbon prostheses, such as the RCPI implant, has expanded the scope of PRC to include more advanced cases with extensive degeneration of articular surfaces. However, the standard technique, which involves resecting the proximal pole of the capitate, often results in incomplete recovery of strength. Current literature doesn't focus on RCPI in young active patients
Aim: This study aims to evaluate both short-term and long-term complications associated with proximal row carpectomy and RCPI implantation in a cohort of young, active patients. Special attention is given to the ability and safety to resume physical activities and return to work, key metrics for assessing the functional success of the procedure in an active population. A secondary aim is to find out if sparing of the proximal pole of the capitate lead to better outcomesMaterial & Methods: This multicenter retrospective study analyzed all young, active patients treated with PRC and RCPI prostheses at the authors' two centers since 2004. Inclusion criteria were age equal or under 65 years old and actively working at the time of surgery. Patients were divided into two groups according to the sparing of the proximal pole of capitate (Group A vs Group B). The inclusion in one group was casual and purely based on the surgeon preference and exerience. Outcomes

assessed included grip strength, active range of motion (ROM), hand function (DASH and PRWE scores), pain (measured using VAS), time to return to work, postoperative complications, and overall patient satisfaction. Additionally, modifications to the RCPI implantation technique, which aim to preserve carpal height and optimize strength, were evaluated
Results: The cohort demonstrated excellent outcomes in terms of grip strength, active ROM, hand function, and patient satisfaction in both groups. Time to return to work was notably favorable, underscoring the technique's suitability for young, active individuals. Complications were infrequent, and their management is discussed in detail. The study also highlights the benefits of a modified RCPI implantation technique that avoids resection of the proximal capitate, preserving carpal height and enhancing strength recovery. Longer follow-ups and further studies are required to evaluate the long term influence of this technique modification on carpus biomechanic and overall functions
Conclusion: RCPI prostheses appear to be a reliable solution for managing advanced wrist degeneration in young, active patients, ensuring good recovery of grip strength, acceptable ROM, and a smooth return to physical activities and work. Further refinement of surgical techniques may lead to even better outcomes, particularly in maintaining carpal height and optimizing functional performance.

A-0884 A USEFUL SURGICAL LANDMARK FOR THE TRAPEZIO-SCAPHOID JOINT

Camillo Fulchignoni, Silvia Pietramala, Lorenzo Rocchi
Policlinico Universitario A. Gemelli, Rome, Italy

Introduction: Despite the clear trend towards treating rhizarthrosis with prosthetic replacement, the procedure of trapeziectomy, whether associated with ligamentoplasty or not, still has a well-defined role. A potential severe complication, which is rarely reported in the literature, is the incorrect removal of the scaphoid. In our experience, to minimize this risk, we use the intersection between the branch of the radial artery and the tendons of the first compartment as a reference point to locate the scapho-trapezial joint. As far as we know, no article describes this reference point. For this reason, we decided through this study to verify its reliability.
Materials and Methods: We included all patients who met our inclusion criteria and underwent trapeziectomy between April 1, 2021, and April 1, 2024. In all patients, during the access to trapeziectomy, after isolating the radial artery, a 16G needle was inserted into the capsule at the intersection between the extensor tendons of the first compartment and the branch of the radial artery, followed by a fluoroscopy shot to verify whether the needle was indeed in the scapho-trapezial joint
Results: Out of 212 operated patients, 186 met our inclusion criteria. The included 186 patients (mean age 67 years) were divided based on sex and stage of rhizarthrosis according to Eaton Littler: 127 women and 59 men; 11 (6 F, 5 M) stage 1 – 63 (45 F, 18 M) stage 2 – 79 (56 F, 23 M) stage 3 – 33 (20 F, 13 M) stage 4. Overall, the reference point was accurate in 178 cases (95.7%). No significant differences were found between men and women (neither overall nor among the various stages); there was no significant difference between stages 1, 2, and 3. However, there was a significant difference in the validity of the test between stages 1-2-3 compared to stage 4 ($p < 0.00001$)
Conclusions: We can conclude that the presented reference point is useful, which is why the authors of this study always use it. It is indisputably valid in stages 1-2-3 and is also useful in stage 4 but deserves more attention since it can sometimes be slightly less precise.

A-0885 NEOFORMATIONS AND TUMORS OF THE HAND AND WRIST: WALANT APPLIED TO 195 CASES

Federico Pilla, Giuseppe d'Antonio, Alberto Rinaldi, Francesco Schilardi, Laura Langone, Vanita Castafaro, Claudio Guidotti, Veronica Longanesi
Istituto Ortopedico Rizzoli, Bologna, Italy

Introduction: Neoformations of the hand and wrist constitute a significant proportion of soft tissue lesions, with the majority being benign and only 2% malignant. Clinical and ultrasound evaluations are often sufficient for identifying lesions smaller than 3 cm that can be safely treated with primary excisional biopsy. For lesions with suspicious features, advanced imaging is warranted. This study examines the outcomes of excisional biopsy performed under WALANT (Wide Awake Local Anesthesia No Tourniquet) in outpatient settings, emphasizing functional and aesthetic results, pain reduction, and optimized resource utilization.
Objective: The primary aim is to evaluate the clinical and histopathological outcomes of neoformations treated with excisional biopsy under WALANT, focusing on its safety, effectiveness, and patient satisfaction. Secondary objectives include assessing the impact of this approach on reducing oncology center workloads and the prognostic implications for patients with histologically confirmed malignancies.
Materials and Methods: We retrospectively reviewed 195 cases of neoformations smaller than 3 cm excised from the hand and wrist between 01/01/2015 and 01/06/2024. Patients over 18 years of age underwent clinical evaluation, imaging (X-rays, ultrasound), and outpatient excisional biopsy under WALANT. Lesions without malignancy risk factors were directly excised, and histological examination was performed on all specimens.
Results: Histopathological analysis revealed mucoid cysts as the most common diagnosis (34.36%), followed by giant-cell tumors of the synovial sheath (27.18%). Malignant lesions were rare (1.03%, 2 cases). Functional and aesthetic outcomes were consistently favorable, with patients reporting significant symptom relief and high satisfaction rates. The WALANT approach demonstrated efficiency in outpatient settings, minimizing patient discomfort and resource utilization.
Conclusions: Our findings confirm the safety and efficacy of WALANT for excision of hand and wrist neoformations under 3 cm, aligning with literature recommendations. This method provides a viable alternative to traditional approaches, significantly reducing the burden on oncology centers without compromising clinical outcomes.
Keywords: WALANT, Neoformations, Hand Surgery, Soft Tissue Lesions, Outpatient Biopsy

A-0886 SURGICAL APPROACH TO SWAN NECK DEFORMITY

Mehmet Balci, Percin Karakol, Muhammet Yasin Babacan, Mert Noyan Dabak, Ongun Alanli
Health Science University Basaksehir Cam and Sakura City Hospital, Istanbul, Turkiye

Introduction: Swan neck deformity is a challenging hand condition often linked to systemic diseases such as rheumatoid arthritis, trauma, or congenital anomalies. It is characterized by hyperextension of the proximal interphalangeal (PIP) joint and flexion of the distal interphalangeal (DIP) joint, causing functional impairment and aesthetic dissatisfaction. Patients may struggle with fine motor tasks such as pinching and grasping. The underlying pathology includes tendon tension imbalances, ligamentous laxity, and musculoskeletal dysfunction, disrupting the normal biomechanics of the hand. Early diagnosis and treatment are vital to prevent progression.
Aim: This study explores the etiology, diagnosis, and surgical approaches for swan neck deformity, with a case review from our clinic.
Material & Methods: We analyzed the surgical intervention and postoperative management of a 44-year-old male patient

treated for swan neck deformity at our clinic in July 2024. The patient experienced restricted motion in both the DIP and PIP joints of the right little finger after a traumatic injury. A surgical plan was executed to restore functionality, followed by structured physiotherapy.
Results: The patient presented with a history of falling, leading to a laceration in the extensor zone 1 of the right little finger. Clinical examination confirmed swan neck deformity, with the DIP joint in a flexion posture and restricted active motion. The PIP joint exhibited hyperextension with limited range of motion.
Surgical findings revealed laxity in the extensor digitorum communis (EDC) tendon, which was plicated to restore tension. The volar plate of the PIP joint was reconstructed using the ulnar slip of the flexor digitorum superficialis (FDS) tendon, which was released proximally and sutured to the volar plate. A longitudinal 1.2 mm K-wire was used for DIP stabilization, and the patient was discharged on the second postoperative day. At the 30-day follow-up, the K-wire was removed, and the patient began a physiotherapy program, resulting in improved functionality.
Conclusions: Swan neck deformity results from various causes, with rheumatoid arthritis being the most common. Traumatic injuries, such as tendon lacerations and ligament disruptions, are also significant contributors. Diagnosis is primarily clinical, supported by imaging techniques like X-rays and ultrasonography. Treatment ranges from conservative methods, including splinting and physiotherapy, to surgical approaches such as tendon plication, volar plate reconstruction, tendon transfers, and arthroplasty. A patient-centered approach is essential, considering the severity of the deformity and the individual's functional needs.Surgical management of swan neck deformity requires precision and multidisciplinary care. Timely diagnosis and appropriate intervention can restore function and aesthetics. Future research should focus on improving surgical techniques and exploring regenerative therapies to enhance outcomes in challenging cases.

A-0887 SURGICAL TREATMENT OF ENCHONDROMAS OF THE HAND: OUR EXPERIENCE IN CURETTAGE ONLY AND AN UPDATE REVIEW OF THE LITERATURE

Stella La Rocca, Silvia Pietramala, Camillo Fulchignoni, Lorenzo Rocchi
Policlinico Universitario A. Gemelli, Rome, Italy

Introduction: Enchondromas are among the most common tumors of the hand, often diagnosed by chance. Their growth progressively destructs the cortical bone leading to pathologic fractures. If spontaneous healing can eventually occur after a fracture, more often a surgical treatment is needed. The most common trend in literature is curettage followed by bone augmentation using bone grafts. Few studies only supports using curettage alone and they mostly involve a small number of patients. No study currently definitely assessed the superiority of one technique. We share our experience on phalanges and metacarpal enchondromas by using curettage only and early mobilization
Aim: The primary outcome of this study is to assess wheter curettage only and early mobilization are reliable and effective treatments for hand enchondroma
Material and Methods: Retrospectively we included all the patients with the diagnosis of enchondroma of the phalanx or metacarpal treated at our centre between June 2022 and June 2024. Exclusion criteria were: final diagnosis non confirmed after histologic exam, any patient treated with bone grafting or any other additional treatment outside curettage, any patients with a shorter follow up than 6 months. We also excluded pediatric patients affected by Ollier and Maffucci's syndrome.
We collected demographic data including history of fracture, oral treatment with bone supplements, time of immobilization, recurrence, time to return to work, overall satisfaction measured with Michigan Score and Quick DASH. Moreover functions was evaluated through Takigawa classification of enchodrnomas

Results: A total of 42 patients were considered eligible for this study. 63% of patients were women with an average age of 38.8 years old. Most involved bone segment was the proximal phalanx of the fifth finger. All patients underwent early mobilization except for 3 cases (7,14%) in which the extended thinning of the cortical bone made necessary a two week immobilization. We registered 1 case of wound dehiscence. Radiographic healing was evaluated with standard X-RAY and CT-scan at 6 months. Healing was achieved at 6 months in 90.47%. Overall patient satisfaction was good. No recurrence was registered.
Conclusions: Despite bone grafting is a well established and reliable treatment for hand enchondroma, no clear data supports its superiority in terms of recurrence and patient's satisfaction compared to simple curettage. Autologous bone grafting may be associated with donor site morbidities and it is associated with post-operative immobilization. Simple curettage is a reliable, costless and effective treatment of hand enchondroma. In cases of extremely distructive and expanding lesions, bone grafts or cements can still be valid options.

A-0888 SAFE AND PRACTICAL SOLUTION FOR THUMB RECONSTRUCTION: KITE FLAP

Oguzhan Tekin, Eda Kübra Koç, Percin Karakol, Berkan Şanlı, Agit Sulhan, Ahmet Uğur Bilmez
Başakşehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, İstanbul, Turkey

Introduction: Extensive dorsal defects of the thumb with the exposure of tendon or bone, is a challenging reconstructive problem. Reconstruction of skin defects in hand injuries requires
flaps to be thin, pliable and most importantly sensate. The innervated first metacarpal artery flap also called as 'Kite Flap' is a good and simple method for reconstruction of these defects. Kite flap is a sensate, thin and pliable flap. Its nerve supply is terminal branch of superficial radial nerve. It has a reliable pedicle with a wide arc of rotation. Kite flap also can cover large defects without sacrificing a proper digital artery. This article is a case report on Kite flap.
Materials and Methods: 20 year old male patient came to our emergency service on 17.10.2024 with the diagnosis of total amputation at the level of the distal phalanx of the first finger of the right hand. The patient, who underwent replantation surgery on 17.10.2024, was followed up with venous congestion. The finger was treated by releasing sutures, bleeding hourly and applying heparin and aspirin.When no improvement was seen in venous congestion, hirudotherapy was started. During the patient's follow-up, necrosis developed in the finger following venous insufficiency. On 30.10.2024, the patient underwent debridement and reconstruction surgery with Kite flap.
Discussion: Thumb reconstruction is important for preserving the function of the hand. Palmar advancement flaps can be preferred for defects under 20 mm. Homodigital island flap is not a good option for tendon and joint exposure injuries. Cross-finger flap is a two-stage reconstruction surgery and as a result, stiffness can be seen in the joints after long immobilization. Littler flap can be a good alternative but its dissection is more difficult than Kite flap. In larger defects, radial forearm flap or free pulp flap are options but donor site morbidity is higher. Kite flap is the leading option for thumb reconstruction due to its low donor site morbidity, easy dissection, reliable anatomy, good aesthetic results and most importantly sensate
Results: The patient was seen on post op 7 snd 30 days. Splint was used for 3 weeks. The patient had gained partial sensation and no disturbing pain or paresthesia of the flap. The postoperative total amount of motion of the reconstructed thumb was very good. The results demonstrated that the FDMCA flap has a constant anatomy and easy dissection. It has a low donor site morbidity if FTSG is used. It also shows good functional and aesthetic results. The FDMCA flap is a first treatment of choice for defects of the proximal phalanx and proximal part of the distal phalanx of the thumb.

A-0889 TREATMENT OF SCAPHOID NON-UNION USING MODIFIED FIXATION FOR MATHOULIN BONE GRAFT TECHNIQUE

Silvia Pietramala, Alessio Greco, Camillo Fulchignoni, Lorenzo Rocchi, Gianfranco Merendi
Policlinico Universitario A. Gemelli, Rome, Italy

Introduction: primary goal in scaphoid nonunion is bone restoration along with reestablishement of wrist function. The usual treatment is conventional bone grafting with or without bony fixation. Vascularized graft based on palmar distal radius blood supply and screw fixation as described by Mathoulin is a reliable and well established technique. We share our experience in scaphoid nonunion treatment with Mathoulin technique using staples as fixation
Aim: the aim of this study is to present a modification to the standard Mathoulin technique and our functional and radiological outcomes.
Materials and methods: from November 2024 to November 2024 retrospectively we collected patients with scaphoid non union treated with vascularized distal radius graft and fixation with staple. Inclusion criteria were: (1) scaphoid non-union diagnosed at least 6 months after primary trauma; (2) any patient treated with vascularized distal radius graft and staple, including also revisions. Each patients was then immobilized by a short cast for 30 days followed by a short splint at night for 3 months. Radiological (XRAY and CT scan) and functional outcomes (Michigan, Quick DASH) were evaluated at 1,6 and 12 months. A detailed description of the modified technique and biomechanical basis are present in this section
Results: we treated 8 patients with Mathoulin modified technique, all patients were male with an average age of 22 years old. We observed union at 6 months in each case expect for 1 which eventually showed fracture healing a 12 months
Conclusions: staple provides good stability to the bone graft without causing any direct damage to it. We hypothise that continous forces exerted by the staple contributes to osteointegration without violating the graft as seen with the screw. A larger cohort of patients along with biomechanical studies are needed to confirm this theory but staple fixation of the graft is a reliable and easy option for scaphoid non union

A-0890 SOFT TISSUE DEFECTS IN THE HAND FOLLOWING TRAUMA OR TUMOR EXCISION: RECONSTRUCTION USING THE QUABA FLAP

Ibrahim Sahin, Yasin Canbaz, Onur Zengin, Sura Koc, Agit Sulhan
Basaksehir Cam And Sakura City Hospital, İstanbul, Turkey

Introduction: Reconstruction of soft tissue defects in the fingers is challenging due to limited local tissue availability. Areas such as the dorsum of the hand near the MCP joint, the dorsal phalangeal region extending to the DIP joint, interdigital web spaces, and distal palmar region benefit from the Dorsal Metacarpal Artery Perforator (DMAP) flap. The Quaba perforator originates from the dorsal branch of the common digital artery, venous drainage occurs through accompanying veins with reverse flow and The Quaba flap is non-sensory.
Materials and Methods: This study evaluates a 72-year-old female patient who presented in June 2024 with a non-healing wound on her right hand for approximately 9 months.
Findings: On examination, a 2x2 cm defect was observed in the second web space of the right hand. Despite previous treatments with wound creams and antibiotics, the wound worsened and an incisional biopsy was performed, which revealed squamous cell carcinoma. Scans showed no metastasis. A Quaba flap that can be lifted from the intermetacarpal space and distal extensor retinaculum was selected for the reconstruction plan.
During surgery, the mass was excised with safe margins, including the paratenon of the second and third digits. A 2.5x7 cm Quaba flap extending from the dorsal D2 and D3 metacarpal dorsal to the distal wrist dorsal was designed to close

the defect. The flap was elevated over the digital bundle at the level of the metacarpal and over the paratenon towards the wrist., and hemostasis achieved. The donor site defect was closed with FTSG

Postoperatively, the flap's circulation and adaptation were monitored, with no complications observed.

Discussion: The Quaba flap is a good treatment option in terms of being a single-session flap that allows finger mobilization, good compatibility with the skin color tone in the area where it is used, allowing the use of more than one flap to close multiple defects, being an extensible flap to close larger defects, and an acceptable donor site morbidity. However, the flap has limitations, such as lack of sensory function and difficulty closing defects larger than 2 cm at the donor site. Additionally, accessing the distal palmar and proximal phalangeal surfaces may increase venous return, and the hairy dorsum of the hand may affect aesthetic outcomes, particularly in individuals with darker skin tones.

Although the digital island flap, which can be used for defects in this region, provides an advantage because it has sensation, it is disadvantageous because the main digital artery is sacrificed and it may cause flexion contracture at the PIP joint level after healing due to the location of the incision line.

Conclusion: The Quaba flap is a reliable, distal-based perforator axial flap that effectively reconstructs soft tissue defects. It is simple to perform, has minimal complications, and provides good functional and aesthetic outcomes, making it a safe option for hand reconstruction

A-0891 VOLAR PLATE RECONSTRUCTION IN THE SURGICAL MANAGEMENT OF POST-TRAUMATIC FLEXION CONTRACTURES - A CASE REPORT

Cemil Öztürk, Agit Sulhan, Yasin Canbaz, Berkan Sanli, Ahmet Ugur Bilmez

Başakşehir Çam ve Sakura City Hospital, Plastic, Reconstructive and Aesthetic Surgery Department, İstanbul, Türkiye

Introduction: Flexion contracture of the proximal interphalangeal (PIP) joint can have a profound negative impact on daily activities. There are few studies in the literature on the results of surgical release of the PIP joint.

Aim: The aim of this study is to report the surgical treatment method and the results of this surgery in a patient with post-traumatic flexion contracture of the PIP joint.

Material & Methods: An 18-year-old female patient presented to us with the complaint of difficulty in extending her left index, middle and ring fingers. The patient's history was that her complaints started approximately 2 years ago after a suicide attempt from the 6th floor, multiple trauma surgeries and a long-term intensive care history.

In the physical examination, when the left hand fingers were brought into forced extension, there was a 90 degree opening in the left hand D2 PIP joint, a 40 degree opening in the left hand D3 PIP joint, a 170 degree opening in the left hand D4 PIP joint, a 160 degree opening in the left hand D3 DIP joint, and a 70 degree opening in the left hand D5 PIP joint. At the same time, the flexion of the left hand D4-5 MP joint was limited.

In the surgical exploration of the patient,.Lazy-s incisions performed for skin incision. Tenolysis was applied to the left hand D2-3-5 Flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP) tendons. The volar plate was loosened at the level of the left hand D3 PIP joint with an incision. Then, in order to prevent the developing PIP joint hyperextension and possible swan neck deformity, the FDS slip on the left hand D3 radial side was incised from a point close to the insertion of the volar plate and sutured to the proximal part of the volar plate, and PIP joint stabilization was achieved. No splint was applied to the patient.

Results: Active movement was started on the patient's 3rd day of the postoperative period. The patient then received 15 sessions of physical therapy. In the 6th month postoperatively, the patient's almost perfect active movements, passive range of motion and pain reduction were observed.

Conclusions: Although the volar plate is important in joint stabilization, it can cause contracture in long-term immobilization and the absance of physical therapy. Unfortunately, tenolysis and skin expander techniques (z plasty etc.) alone are not sufficient in the most cases management of advanced flexion contractures. In such cases, it may be necessary to resort to volar plate release and reconstruction. One of the most important points to be considered in surgery is to prevent the joint from going into hyperextension and to minimize the development of additional deformity. Of course, protecting the neurovascular bundles during surgery, preventing their excessive tension and performing staged surgery if necessary should also be considered as an option.

A-0892 RADIAL HEAD ARTHROPLASTY WITH A DUAL MOTION PROSTHESIS: POSTOPERATIVE MID-TERM OUTCOMES

Panagiotis Konstantinou[1,2], Lazaros Kostrentzis[1], Charalampos Pitsilos[1], Paschalis Antonogloudis[1], Pericles Papadopoulos[1], Konstantinos Ditsios[1]
[1]2nd Orthopaedic Department of Aristotles University, 'G. Gennimatas' Hospital, Thessaloniki, Greece; [2]Health Centre Of Neapoli, Thessaloniki, Greece

Introduction: Radial head fractures are intra-articular fractures often associated with instability and limited motion in the elbow joint. When there are three or more bone fragments or instability, radial head replacement with a prosthesis is preferred.
Aim: The purpose of this study is to evaluate the postoperative mobility and functional outcomes of patients who underwent radial head arthroplasty for the treatment of complex fractures.
Material & Methods: A retrospective study was conducted on patients who underwent radial head replacement with a dual motion prosthesis (ICARA Radial Head System) at the 2nd Orthopaedic Department of Aristotles University at the "G. Gennimatas" General Hospital of Thessaloniki from February 2020 to December 2024. Patients were clinically assessed for elbow flexion-extension range of motion and forearm pronation-supination, and functionally assessed using the Disabilities of the Arm, Shoulder and Hand (DASH) score, Mayo Elbow (MES) score, Medical Research Council (MRC) muscle strength score, and the American Shoulder and Elbow Surgeons (ASES) score. Complications were also recorded.
Results: Nineteen patients were included in the study. The average age was 62.4. while the average follow-up was 34 months. The average flexion-extension range of motion was 120° and the pronation-supination range was 102°. Regarding the scores, the average DASH was 30.5, the average MES was 84, the average ASES was 81.4, and the average MRC score was 5. Two postoperative dislocations were recorded.
Conclusions: Radial head arthroplasty with a dual motion prosthesis for the treatment of complex fractures is associated with encouraging mid-term outcomes, as it results in satisfactory mobility and functionality while presenting minimal complications.

A-0893 THE REALITY OF OPEN HAND FRACTURES: COMPARISON OF FUNCTIONAL OUTCOMES IN HAND OPEN FRACTURES, EARLY VS DELAYED TREATMENT AND CONSIDERATIONS ON TULIPAN'S CLASSIFICATION

Camillo Fulchignoni, Silvia Pietramala, Arturo Militerno, Maurizio Marinangeli, Andrea Cruciani, Lorenzo Rocchi
Policlinico Universitario A. Gemelli, Rome, Italy

Introduction: Open fractures are a well-established concern in orthopedic surgery, with treatment guidelines clearly outlined by the Gustilo-Anderson classification. While this classification is broadly applicable to lower limbs and proximal

regions of the upper limbs, hand open fractures present unique challenges. Even a small wound in the hand can expose bone, making digits particularly vulnerable to open injuries from minimal trauma. Recognizing this, Tulipan proposed a new classification specifically for open hand fractures.
Aim:The primary aim of this study is to evaluate whether early surgical treatment (within 12 hours) impacts final outcomes. The secondary aim is to explore whether the term "open fracture" is appropriate in the context of hand surgery.
Materials and Methods: We retrospectively analyzed patients treated at our center for open fractures of the phalanges or metacarpals between November 2023 and November 2024. Inclusion criteria included: (1) fractures of the phalanges or metacarpals associated with a wound, and (2) subamputations or amputations. Exclusion criteria included digits requiring immediate revascularization. Patients were divided into two groups based on the timing of surgery (within 12 hours, between 12 and 72 hours vs. after 72 hours). Radiographic and functional outcomes were assessed at 1, 6, and 12 months post-surgery.
Results: No significant differences were observed between the two groups regarding fracture healing, infection rates, or functional outcomes
Conclusions: The concept of "open fracture" in hand surgery is debatable. Furthermore, emergency treatment within 72 hours does not always yield superior outcomes, suggesting that management strategies should be individualized.

A-0894 HEMI-HAMATE ARTROPLASTY IN LONG TERM PIP JOINT ARTHROSIS

Bilge Kaan Kilicoglu, Muhammet Acar, Omer Buyukkaya, Mesut Turk, Yasin Canbaz
Basaksehir Cam and Sakura City Hospital, Plastic, Reconstructive ve Aesthetic Surgery Department, İstanbul, Türkiye

Objective: Proximal interphalangeal (PIP) joint injuries represent a common hand injury, encompassing a spectrum of severity from minor sprains to complex intra-articular fractures. That is important because adequate grip strength relies heavily on the flexion and extension capabilities of the proximal interphalangeal (PIP) joint. It is estimated that the PIP joint contributes approximately 85% of the motion required for functional grip.(1) PIP joint fractures can cause significant functional limitations, including finger stiffness and reduced range of motion, and may ultimately result in the development of post-traumatic osteoarthritis.(2) Especially the dorsal side of proximal phalanx fractures affect the stability of the PIP joint and can cause further limitation of range of motion. There are multiple treatment modalities according to the amount of fracture such as external pinning, open reduction and internal fixation, volar plate artroplasty and hemi-hamate artroplasty. Even if with proper other treatments, complications following PIP joint injury treatment are diverse and can include joint stiffness, flexion contracture, re-dislocation, post-traumatic arthritis, chronic swelling, and permanent functional loss.(1) Because of the similarity of the anatomy, hemi-hamate artroplasty can be evaluated as the treatment of choice especiallly in significant functional limitations due to protect the joint functions and finger movements both for acute and chronic conditions.(3)
Materials and Method: This study included five patients who were referred to our clinic between January 2023 and November 2024 with complaints of pain and restricted movement resulting from arthrosis secondary to a prior PIP joint fracture. The average age of the patients were 58 (min:40 – max:64). Two patients presented with arthrosis in the D3 joint of the left hand, one with arthrosis in the D2 joint of the left hand, one with arthritis in the D2 joint of the right hand, and one with arthrosis in the D3 joint of the right hand along with a mallet finger deformity of the same finger. In all patients, the observed arthrosis was secondary to malunion following a previous trauma. All patients underwent hemihamate osteochondral autograft arthroplasty under regional anesthesia. Passive flexion and extension performed intraoperatively revealed a full range of motion in all cases.

Results: Postoperative follow-up and early rehabilitation were initiated for all patients. No complications were observed during the inpatient period, and patients were discharged on average on the 5th postoperative day (range: 3-7 days). Subsequent follow-up visits revealed no complications at the PIP joint, digit, or donor site.
Conclusion: With a proper follow-up and early rehabilitation, even if hemi-hamate artroplasty mostly used for a salvage procedure can also be the treatment of choice in the cases of the PIP joint arthrosis. It can be dependable and efficacious technique for reconstructing complex injuries, particularly in cases of extensive comminution. However, further long-term studies are necessary to evaluate the long-term outcomes and potential complications associated with this procedure.

A-0895 DELAYED EXTENSOR TENDONS RUPTURES AFTER DISTAL RADIUS FRACTURE. FREE TENDON GRAFT RECONSTRUCTION UNDER WALANT

Ana Carreño, Anna Domingo, Laia Sabaté, Daniel Martin
Hospital Clinic Barcelona, Spain

Introduction: Delayed rupture of extensor tendons is an uncommon but severe complication after volar plate fixation of distal radius fractures. The extensor pollicis longus (EPL) is the most injured tendon. The laceration of the extensor digitorum communis (EDC) and extensor indicis proprius (EIP) by dorsal fragments converted into a bone spur have occasionally been described. Early recognition and appropriate reconstruction are crucial to restoring hand function.
Aim: This case report describes successful management using free tendon grafts under Wide Awake Local Anesthesia No Tourniquet (WALANT) for EPL, EIP and EDC index tendon ruptures.
Material & Methods: A 70-year-old male sustained a distal radius fracture (AO type C3) due to a motorcycle accident managed with volar plate fixation. After three months, he progressively lost active finger extension. Clinical examination and ultrasound imaging suggested complete ruptures of the EPL, EIP, EDC index, and partial rupture of EDC middle finger. A screw protrusion in the second dorsal compartment was confirmed during surgery, but the cause of the progressive ruptures was extensor tendon entrapment under a bony fragment that was removed.
Surgical reconstruction was performed using Palmaris longus and hemi-Extensor Carpi Radialis Longus free tendon grafts under WALANT. This approach allowed for real-time intraoperative assessment of graft tension and full active mobility of the fingers in flexion and extension.
Results: At 8 months the patient has a painless and functional hand, which he uses in all activities of daily living. He has a mild deficit of IF extension of the thumb and complete pulp-to-palm contact of the fingers.
Conclusions: Extensor tendon rupture associated with volar plating in distal radius fractures may be associated with protruding screws or dorsal bone fragments. If suspected, they should be treated surgically. The WALANT technique offers important advantages, such as the elimination of the risks of tourniquet or general anesthesia, facilitate decision making such as reconstruction with grafts or the need for tendon transfers and the possibility for the patient to actively participate in the procedure.

A-0896 ROLE OF POST-OPERATIVE REHABILITATION IN TM JOINT ARTHTIS: FUNCTIONAL OUTCOMES OF INTERPOSITION TRAPEZIECTOMY VS PROSTHESIS

Silvia Pietramala, Camillo Fulchignoni, Leopoldo Arioli, Emanuele Gerace, Lorenzo Rocchi
Policlinico Universitario A. Gemelli, Rome, Italy

Introduction: Trapeziometacarpal (TM) joint arthritis is a common condition causing pain and functional limitations, particularly in activities requiring pinch and grip strength. Surgical options such as interposition trapeziectomy and prosthetic joint replacement have demonstrated varying degrees of success. However, the role of post-operative rehabilitation in optimizing outcomes for these procedures remains underexplored. Effective rehabilitation may be critical for restoring strength, range of motion (ROM), and overall hand function, yet no consensus exists on the best approach for either surgical modality.
Aim: This study aims to evaluate the impact of post-operative rehabilitation on functional and clinical outcomes in patients undergoing interposition trapeziectomy versus prosthetic replacement for TM joint arthritis.
Materials & Methods: A retrospective cohort study was conducted on patients treated for TM joint arthritis between November 2023 and November 2024. Patients were divided into two groups based on the surgical procedure: interposition trapeziectomy and prosthetic replacement. Patients randomly followed post-operative rehabilitation protocols, auto-assisted exercises or no type of rehabilitation. Outcomes assessed included pain (VAS), ROM, grip and pinch strength, hand function (DASH score), and patient satisfaction at 3, 6, and 12 months post-surgery. Complications and re-intervention rates were also recorded.
Results: The group of prosthesis consisted of 42 patients while only 38 patients underwent interposition trapeziectomy Patients in both groups showed good improvements in pain, ROM, and hand function post-rehabilitation. The prosthetic group demonstrated faster recovery of strength and higher early satisfaction scores, but in the long term the results were overlapping. No significant differences were observed in long-term functional outcomes or patient satisfaction at 12 months. In the trapeziectomy group, patients who followed a rehabilitation program showed a higher satisfaction score and earlier return to work
Conclusions: Post-operative rehabilitation plays a pivotal role in recovery after both interposition trapeziectomy and prosthetic replacement for TM joint arthritis. While prosthetic replacement allows for quicker functional recovery, interposition trapeziectomy offers comparable long-term results with a lower complication profile. Tailored rehabilitation protocols may enhance outcomes and should be an integral part of TM joint arthritis management.

A-0897 CASE REPORT OF SYNDACTYLY SEPARATION IN PATIENT WITH APERT SYNDROME

Eşref Kaan Bulut, Yasin Canbaz, Kadir Barış Tiryaki, Ramazan Melih Parlak, Eren Tuncer
Başakşehir Çam ve Sakura City Hospital, Plastic, Reconstructive and Aesthetic Surgery Department, İstanbul, Türkiye

Introduction: Apert syndrome is a congenital disorder characterized by craniosynostosis, a cone-shaped calvarium, midface hypoplasia, pharyngeal attenuation, ocular manifestations, and syndactyly of the hands and feet. Mutations in the fibroblast growth factor receptor 2 (FGFR2), specifically Ser252Trp or Pro253Arg, are responsible for nearly all known cases of the syndrome. The incidence of Apert syndrome is estimated at 1 in 65,000 to 88,000 live births. Syndactyly in Apert syndrome is classified based on the degree and location of the fusion between digits.
In patients with Apert syndrome, the primary treatment goal is to restore hand function and improve aesthetic appearance. In the management of syndactyly, techniques such as Z-plasty, K-plasty, skin grafts, local flaps, and other materials may be utilized as needed to separate the webbed fingers.

Aim: This study aims to restore hand function and achieve an aesthetic appearance in patients with Apert syndrome through a staged surgical approach.
Material & Methods: We present a 4-year-old male patient diagnosed with Apert syndrome, who presented with bilateral type 2 mitten hands. The patient underwent four surgical procedures between September 2023 and November 2024. The first surgery was performed on the bilateral first web spaces, where syndactyly was separated using the K-M plasty technique. Three months later, the second surgery focused on the bilateral third web spaces, where Z-plasty was used, and a full-thickness skin graft (FTSG) was harvested from the inguinal area to close the defect. Eight months later, a third surgery addressed the syndactyly in the second web space of the left hand, utilizing Z-plasty and FTSG. In November 2024, the patient required a fourth surgery to address synostosis in the bilateral third web spaces, which were separated and reconstructed using acellular dermal matrix (ADM) and FTSG.
Results and Conclusions: The primary goals of the treatment were to restore opposition movement and enhance grip function while achieving an improved aesthetic appearance. These objectives were successfully met, resulting in significant functional and aesthetic improvement in the patient's hand function.

A-0898 SKIER'S THUMB REPAIR WITHOUT TRANSECTION OF THE ABDUCTOR APONEUROSIS

Yannick Goubau[1], Romy Balcaen[1], Wim Vanhove[2]
[1]AZORG Hospital, Aalst, Belgium; [2]University Hospital, Ghent, Belgium

Introduction: An injury to the ulnar collateral ligament (UCL) of the metacarpophalangeal joint (MCPJ) of the thumb is a common injury, widely referred to as a skier's thumb. In the classical technique, the adductor aponeurosis is divided to access the torn UCL and the MCPJ and repaired after ligament repair/reinsertion. This might lead to adhesion formation, resulting in articular stiffness and tenodesis of the extensor pollicis longus tendon. We describe a surgical technique to the UCL that does not require division of the adductor aponeurosis. Our hypothesis is that this might result in superior range of motion.
Aim: We analyse the functional results of our case series, and compare it to the unaffected side. We also compare our results to historic results of the classic technique.
Material & Methods: 9 patients were able to attend follow up. Range of motion of the MCPJ and IPJ was measured, key pinch strength and a DASH questionnaire was taken.
Results: mean total arc of motion (TAM) of the MCPJ was 56°, compared to 72° of the unaffected side. Mean TAM of the IPJ was 80°, compared to 94° of the unaffected side, reflecting a slight decrease in range of motion. The median Kapandji score was 9, compared to 10 in the unaffected side. Mean keypinch force was 6.67 kg, compared to 7.56 in the unaffected side. Mean DASH score was 8.02, which is comparable to healthy patients
Conclusions: A slight decrease in motion was noted. Patients lost 1 point in the Kapandji scale on average, compared to the unaffected side. If we compare the ranges of motion to historical data, our results show a superior range of motion. We can conclude that our technique might result in superior functional results compared to the classic technique.

A-0899 REVERSE TOTAL SHOULDER ARTHROPLASTY IN BILATERAL SHOULDER DISLOCATION: WHEN THE DELTOID DOES NOT WAKE UP

Miguel Picallo Fernández, Jose Sánchez González, Raquel Maroto-Rodríguez, Andrés Pérez Prieto, Claudia Castellò Mendoza
Hospital de Mataró, Spain

Introduction: Reverse shoulder arthroplasty (RSA) has proven to be an effective surgical option for patients with advanced rotator cuff pathology, particularly those with massive, irreparable rotator cuff tears and associated glenohumeral arthritis. Despite deltoid atrophy or paralysis, this intervention has shown positive outcomes, including pain relief and, in some cases, improved shoulder function, even when deltoid function is not fully preserved. Previous studies have documented that although deltoid function is a key factor for the success of reverse shoulder prosthesis, pain relief and quality of life improvements can still be achieved, even in the presence of deltoid atrophy or partial dysfunction. However, severe deltoid atrophy remains a relative contraindication for this surgery, as this muscle is critical for generating functional shoulder movements when the rotator cuff is not functional.

Aim: To evaluate the viability of reverse shoulder arthroplasty in patients with deltoid atrophy secondary to nerve injury, considering that this condition constitutes a relative contraindication. We analyze the importance of axillary nerve function preservation and deltoid viability as determining factors for the success of the prosthesis, and discuss the potential benefit of the procedure in terms of pain control.

Materials & Methods: We present the case of an 83-year-old woman with a history of hypertension and dyslipidemia, who suffered a greater tuberosity fracture and left shoulder dislocation following an accidental fall. Subsequently, she experienced a second fall, resulting in a right shoulder dislocation without associated fractures. After conservative management, the patient presented with functional loss of the right shoulder, being unable to perform abduction and elevation movements. Magnetic resonance imaging (MRI) and electromyography (EMG) evaluation suggested deltoid paralysis secondary to a pre-ganglionic injury to the upper and middle trunks of the brachial plexus. Due to the lack of improvement with conservative treatment, the placement of a reverse shoulder prosthesis was considered for pain control.

Results: During follow-up, the patient showed partial recovery of mobility in the left shoulder, suggesting partial recovery of the brachial plexus. However, the right shoulder remained significantly impaired, with deltoid atrophy and inability to perform abduction or elevation. Preoperative planning with CT confirmed adequate bone stock in the glenoid cavity and humeral head, making reverse shoulder prosthesis feasible. In contrast, the EMG of the right shoulder revealed a lack of voluntary contraction of the deltoid, confirming muscle paralysis. Despite deltoid dysfunction, it was decided to proceed with reverse shoulder arthroplasty to control pain, as other conservative treatments had not been effective.

Conclusion: Reverse shoulder arthroplasty in patients with deltoid atrophy secondary to nerve injury remains a viable surgical option, although it is a relative contraindication. Despite deltoid dysfunction, the procedure has the potential to provide significant pain relief and improve quality of life. The viability of the surgery depends on careful assessment of axillary nerve function, bone stock, and residual deltoid capacity. This case demonstrates that although active shoulder function cannot be fully restored in patients with severe deltoid atrophy, reverse shoulder arthroplasty can still be beneficial for pain control.

A-0900 ALTERNATIVE TREATMENT IN KIENBOCK'S DISEASE: 4-5 ECA PEDICLED OSSEOUS FLAP - A CASE REPORT

Osman Onac, Yasin Canbaz, Abdullah Colcinar, Oguzhan Tekin, Kurtulus Oz
Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department, İstanbul Turkiye

Introduction: Kienböck's disease is a progressive condition that affects the lunate bone, leading to avascular necrosis. Treatment options for this disease range from conservative management to wrist arthrodesis. One surgical approach involves the use of various pedicled bone flaps, such as the 4-5 Extensor Compartmental Artery (ECA) flap, which can be applied to the lunate bone in Kienböck's disease.
Aim: This study aims to present our experience with using the 4-5 ECA bone flap for the treatment of this condition.
Material & Methods: A 39-year-old male patient presented with a progressively worsening wrist condition, which had been ongoing for two years. The patient underwent surgery in the supine position under regional anesthesia An incision, approximately 7 x 8 cm, was made on the dorsal side of the wrist, between the 4th and 5th extensor compartments, both proximally and distally. The 5th extensor compartment was incised and retracted, while preserving the dorsal carpal vascular arch. The extensor compartments were dissected from the capsule over the lunate bone. A radial-based flap-shaped capsulotomy was then performed starting from the 5th extensor compartment, and the lunate was identified under fluoroscopic guidance. The articular surfaces of the lunate bone were carefully examined. If no signs of arthrosis were present and the cartilage was intact, a pedicled bone flap was considered. The cortex of the lunate was elevated dorsally using a burr or multiple K-wire drillings, ensuring that the cartilage surface was preserved. Sclerotic bone in the lunate was removed via curettage under fluoroscopy control. Next, the arteriovenous bundle between the 4th and 5th extensor compartments was located using a surgical loop. The artery was traced proximally to the posterior branch of the anterior interosseous artery, where it exited dorsally from the interosseous membrane. The 4th ECA, originating from the same artery, was also identified, and by following it distally, the region of bone it supplies on the distal dorsal radius was located. This area, which is approximately 1 cm proximal to the radiocarpal joint, corresponding to the required bone flap size. Using a thin osteotome, the bone was carefully lifted while preserving the vascular pedicle. The pedicle was ligated and separated from the anterior interosseous artery at the point where the 4th and 5th ECAs branch off .The vascular structures were meticulously dissected, and the surrounding soft tissues were loosened to facilitate the transfer of the bone flap into the lunate.
Results: The pedicled bone flap was carefully positioned on the dorsal aspect of the lunate without tension. To prevent collapse of the lunate, temporary K-wires were inserted from the scaphoid to the capitate. Finally, the dorsal capsule was sutured, ensuring the vascular structures were protected, followed by closure of the extensor compartments and skin.
Conclusions: In conclusion, our study presents the 4-5 ECA pedicled flap procedure as a treatment for Kienböck's disease. The results from the literature indicate notable improvements in both clinical and radiological evaluations, reinforcing the idea that this surgical technique is a safe and effective option for managing the condition.
Despite certain limitations in our study, the positive outcomes associated with the 4-5 ECA pedicled flap suggest that it is a reliable and promising treatment, particularly for patients with Lichtman Grade 2 and 3 Kienböck's disease.

A-0901 SALVAGE PROCEDURES FOLLOWING SEPTIC ARTHRITIS AND OSTEOMYELITIS OF THE WRIST

Joe Barrett-Lee, Chris Little, Nicholas Riley
Oxford University Hospitals NHS Trust, Oxford, United Kingdom

Introduction: Bone and joint infections in the distal upper extremity are fortunately uncommon but can have devastating consequences. Resultant osteochondral damage leads to pain and loss of function, often requiring surgical management.

Aim: This review aimed to assess the safety and efficacy of salvage procedures in native wrist infections.
Material & Methods: Patients were identified by interrogation of our institutions' database of theatre cases. Patients undergoing surgery for treatment of septic arthritis or osteomyelitis of the wrist were included. Electronic patient records were reviewed to obtain demographics, presentation and management, and clinical outcomes.
Results: Nine patients were included with a mean age of 48 years. Most were male (8 patients) and smokers (6 patients). Five had a history of trauma and 5 had metalwork in situ prior to infection. The median chronicity of infection before referral to our institution was 5 months and 7 had undergone debridement prior to referral. Methicillin-sensitive staphylococcus aureus (MSSA) was grown most frequently (6 cases), followed by pseudomonas aeruginosa (2 cases), methicillin-resistant staphylococcus aureus (1), streptococcus dysgalactiae (1), and staphylococcus epidermidis (1). Salvage procedures included wrist arthrodesis (7 cases), pyrocarbon interposition wrist arthroplasty (1 case), and total wrist arthroplasty (1 case). Clearance of infection was complete in all cases and there were no revision surgeries for recurrent infection at a median of 3 years (range 6 months - 6 years). There were no major surgical complications
Conclusions: In optimally medically managed patients, with appropriate surgical debridement and antibiotic treatment, salvage procedures for native wrist infection are safe and effective.

A-0902 RECURRENT MALLET FINGER DEFORMITY DUE TO CHRONIC TRAUMA AND OUR TREATMENT APPROACH

Ali Ensar Gündüz, Percin Karakol, Onur Zengin, Agit Sulhan, Cemil Öztürk
Basaksehir Cam and Sakura City Hospital, Plastic Reconstructive and Aesthetic Surgery Department Istanbul, Turkey

Introduction: Mallet finger deformity is characterized by extensor tendon dysfunction at the distal interphalangeal (DIP) joint, leading to flexion deformity. This condition, often caused by trauma, may result in chronic and recurrent issues if untreated or inadequately managed.
Case Report: A 37-year-old male presented with a two-year history of limited movement in the right index finger and a snapping sensation in the middle finger. Despite two prior surgeries, persistent deformity and functional impairment were observed. Surgical intervention included tenolysis, tendon plication, and DIP joint fixation using a Kirschner wire. Postoperative evaluation revealed improved tendon tension and joint stability.
Discussion: Although nonoperative management is typically sufficient for mallet finger injuries, complex or chronic cases may require tailored surgical approaches. This case underscores the importance of individualized treatment based on injury type, patient occupation, and prior interventions.
Conclusion: Surgical intervention is a viable option for recurrent or chronic mallet finger deformities, particularly in patients with significant functional demands. A multidisciplinary and patient-specific approach ensures optimal outcomes.

A-0903 FREE SCIP FLAP IN TISSUE DEFECT DUE TO CHEMOTHERAPEUTIC DRUG EXTRAVASATION

Furkan Ekiz, Percin Karakol, Abdullah Çölçinar, Erden Erkut Erkol, Esref Kaan Bulut
Basaksehir Cam and Sakura City Hospital, Plastic, Reconstructive and Aesthetic Surgery Department, İstanbul Türkiye

Introduction: Upper extremity defects are commonly encountered in reconstructive microsurgery, and thin, soft flaps are required to maintain the natural appearance and aesthetics of the extremity. The superficial circumflex iliac artery perforator (SCIP) flap is a suitable option because it is thin, flexible, and medium-sized. The SCIP flap is fed by perforators from the superficial circumflex iliac artery and drains into the saphenous vein via cutaneous veins. It has no sensory

innervation, a short pedicle (2-5 cm), and a small-caliber artery (1-2 mm). This study presents a case of reconstruction using a free SCIP flap for a burn defect on the dorsum of the hand.
Materials and Methods: In September 2023, a 71-year-old female patient was consulted to our Plastic Surgery clinic by the Oncology clinic due to a chemotherapy drug extravasation injury on the dorsum of her hand. CT, angiography, and Doppler ultrasonography were performed to evaluate the vascular structure. The sartorius muscle, inguinal ligament, and iliac crest were identified to design the flap. The arterial pedicle location was confirmed using hand Doppler, approximately one finger width below the inguinal ligament. The flap was then raised, and after achieving hemostasis, the defect in the left hand was reconstructed with end-to-side anastomosis to the radial artery. The surgery lasted approximately 280 minutes, and the patient was discharged after 7 days. She was followed up prospectively for 8 months without complications. After 8 months, a debulking surgery with vaser liposuction was performed. The patient's follow-up continues.
Discussion: Perforator flaps can be designed either locally or as free flaps and are favored in recent years due to their low donor site morbidity and flexibility in design. The free SCIP flap, first described by Koshima et al. in 2004, consists of perforators from the superficial circumflex iliac artery and cutaneous veins, with no sensory innervation. Advantages of this flap include short dissection due to a short pedicle, quicker flap elevation, versatility, ease of thinning, minimal donor site morbidity, aesthetic adaptation to the upper extremity, and the presence of a large cutaneous vein for venous drainage. Disadvantages include the need for precise dissection to identify smaller perforators, lack of sensory innervation, and difficulties with anastomosis in vessels with a diameter less than 1 mm.
Conclusion: Upper extremity reconstructions remain challenging in Plastic, Reconstructive, and Aesthetic Surgery. This case demonstrates the utility of the SCIP flap in upper extremity reconstructions. Due to its low donor site morbidity, aesthetic compatibility, and flexibility, the SCIP flap should be considered an important option for achieving optimal aesthetic results in reconstructing upper extremity defects.

A-0904 SIMULTANEOUS TMC AND STT PROSTHESES FOR PANTRAPEZIAL OSTEOARTHRITIS: A PROMISING ALTERNATIVE TO TRADITIONAL TECHNIQUES

Beatriz Mirón Domínguez[1],Sergi Barrera-Ochoa[1], Marta Méndez Álvarez[2], Rita Pereira Cavaca[3], Alejandro Meritano[4]
Institut de la ma[1]; Complejo hospitalario de Ourense[2]; Centro hospitalar e universitario de Coimbra[3]; Hospital universitario austral de Argentina[4]

Introduction and aim: Pantrapezial osteoarthritis significantly impacts the trapeziometacarpal (TMC) and scaphotrapezial-trapezoid (STT) joints, causing pain, functional loss, and necessitating surgery. Traditional techniques (trapeziectomy, ligament reconstruction with tendon interposition (LRTI), suspensoplasties) yield variable long-term outcomes. This dual-prosthesis approach aims to improve outcomes by preserving carpal stability and thumb function.
Material & Methods: This retrospective study analyzed 41 patients with advanced pantrapezial osteoarthritis who underwent simultaneous TMC and STT prosthesis implantation. Functional outcomes were assessed using grip, pinch (tip and key), and key strengths; range of motion (ROM); and the Kapandji score. Patient satisfaction was measured using QuickDASH and Patient-Rated Wrist Evaluation (PRWE) scores. Complications and revision rates were documented. Results were compared to published data on trapeziectomy, LRTI, suspensoplasties, and pyrocarbon interposition arthroplasty.
Results: At a mean four-year follow-up, grip strength reached 95% of the contralateral side; tip and key pinch strengths reached 100%, with no decline over time. ROM and Kapandji scores improved significantly ($p<0.05$) from pre-operative values. High patient satisfaction was reported (mean QuickDASH 5, mean PRWE 6). No instability was observed, and the complication rate was lower than with traditional techniques (one revision).

Conclusions: Simultaneous TMC and STT prosthesis implantation offers a promising solution for pantrapezial osteoarthritis, overcoming biomechanical limitations of prior techniques. By preserving carpal stability and thumb function, this approach achieves favorable functional outcomes and a reduced complication rate, making it a potentially superior alternative for patients with high functional demands or those requiring durable long-term results. Limitations include the retrospective design and relatively small sample size. Further research with larger cohorts and longer follow-up is needed.
Keywords: Pantrapezial Osteoarthritis, Trapeziometacarpal Arthroplasty, Scaphotrapezial-Trapezoid Arthroplasty, Dual Prosthesis, Thumb Arthroplasty, Functional Outcomes.

A-0905 RATIONALE OF THE CUSTOM-MADE LUNATE PROSTHESIS WITH A NEW ORIGINAL TECHNIQUE OF STABILIZATION: 5 YEARS FOLLOW UP

Simona Odella[1], Ignazio Marcoccio, Alice Clemente[2], Matilde Cacianti, Francesco Locatelli[1], Pierluigi Tos[1]
[1]Operative Unit of Hand Surgery and Reconstructive Microsurgery, ASST Gaetano Pini – CTO, Milan, Italy; [2]Department of Orthopedics and Traumatology, University of Milan, Milan, Italy

Introduction: Kienböck's disease, an avascular necrosis of the lunate, has an uncertain etiology. The main theory suggests a vascular insult that leads to impaired blood flow and bone necrosis. The disease likely has a multifactorial cause, including mechanical overload. Treatment options are categorized into core decompression, lunate unloading, lunate revascularization, and salvage procedures based on the disease stage. According to the Lichtman classification, stage III disease is characterized by lunate fragmentation and height reduction, associated with carpal collapse, proximal migration of the capitate, diastasis of the first carpal row, and scaphoid flexion. Stage IIIA is differentiated from IIIB by the presence of a fixed scaphoid flexion and a radio-scaphoid angle greater than 60°. In stage IIIA, a custom-made lunate prosthesis is a potential solution.
Methods: Six patients (four males aged 19, 21, 22, 27, and two females aged 18 and 50) presented with persistent wrist pain resistant to drug therapy, localized mainly to the dorsal side, and with functional limitations in flexion-extension. None of the patients had a history of high-energy trauma. Radiographic examinations revealed structural deformities of the lunate in both anteroposterior and lateral views. CT and MRI confirmed the collapse and fragmentation of the lunate with non-fixed scaphoid flexion, placing the disease between stages IIIA and IIIB of Lichtman. After discussing treatment options, the patients were offered an experimental approach involving the implantation of a 3D-printed custom-made prosthesis, mirrored from the contralateral lunate. To prevent dislocation, the prosthesis was carefully stabilized with tunnels in the device, and the scapho-lunate and luno-triquetral ligaments were reconstructed using the FRC tendon, following a modified Garcia Elias technique. Patients were followed clinically and radiographically at 1, 3, 6 months, 1 year, and 5 years.
Results: At 4 years of follow-up, all six patients had stable wrists with full range of motion (ROM) in pronation-supination and 60° flexion-extension, without pain during load-bearing activities. Radiographs showed that the prosthesis remained well-positioned, with no signs of attrition in adjacent carpal bones. One patient had a stable wrist and a 70° ROM in flexion-extension but an open space visible on X-ray.
Conclusion: Although this study involves a small sample size and limited follow-up, the results suggest that a custom-made lunate prosthesis combined with ligament reconstruction (tenodesis) is a viable surgical option for treating Kienböck's disease in young patients who have specific functional demands and are not inclined to undergo more invasive procedures. Salvage procedures, such as first carpal row resection, remain an alternative when the disease progresses. This approach appears to provide a promising solution for managing stage IIIA Kienböck's disease, avoiding more radical interventions. Further studies with larger cohorts and longer follow-up are needed to confirm these findings.

A-0906 INTRAMEDULLARY SCREW FIXATION: A MINIMALLY INVASIVE APPROACH TO PROXIMAL PHALANX MALUNION WITH EARLY MOBILIZATION AND EXCELLENT FUNCTIONAL RECOVERY

Sergi Barrera-Ochoa
Institut de la ma

Introduction and Aim: Malunion of the proximal phalanx, particularly near the metacarpophalangeal (MCP) joint, poses significant challenges. Traditional fixation methods (plates, Kirschner wires) often necessitate secondary procedures for hardware removal and may result in complications such as tendon adhesions or infections. This study presents a minimally invasive alternative: intramedullary screw fixation.
Case Presentation: A 63-year-old woman presented with pain, limited MCP joint flexion, and PIP joint blockage in her fifth finger due to a proximal phalanx malunion (35º extension deformity) following inadequate immobilization.
Material & Methods: Anterograde intramedullary screw fixation was performed via a single, minimally invasive lateral approach. A realignment osteotomy corrected the deformity, followed by insertion of a 2.2 mm x 26 mm cannulated screw under fluoroscopic guidance. A percutaneous technique was used under regional anesthesia with cubital nerve block. Postoperative immobilization was followed by early mobilization (one week post-op), facilitated by an interphalangeal extension orthosis.
Results: At one year postoperatively, the patient achieved full (0º to 90º) MCP joint flexion and extension. PIP joint flexion improved significantly from -60º to 0º. The orthosis was discontinued after two months. These results indicate excellent restoration of hand function and full joint mobility. The Disabilities of the Arm, Shoulder, and Hand (DASH) score was 5, and the patient reported 10/10 satisfaction.
Conclusions: Intramedullary screw fixation offers a reliable, minimally invasive alternative to plates and Kirschner wires for proximal phalanx malunion, particularly near the MCP joint. This approach facilitates early mobilization and minimizes complications while achieving excellent functional recovery at one-year follow-up. The avoidance of secondary surgery for hardware removal further strengthens its advantages. While a single case, these findings warrant investigation in larger cohorts to confirm its efficacy and expand its application.
Keywords: Proximal Phalanx Malunion, Intramedullary Screw Fixation, Minimally Invasive Surgery, Early Mobilization, Carpal Tunnel Syndrome, Hand Surgery, Functional Outcome.

A-0907 SURGICAL TREATMENT OF PHALANGEAL FRACTURES USING PERCUTANEOUS EXTERNAL FIXATION: A REPORT OF 45 CONSECUTIVE CASES

Simona Odella[1], Alice Clemente[2], Francesca Pedrini[3], Francesco Locatelli[1], Mauro Magnani[1], Pierluigi Tos[1]
[1]Operative Unit of Hand Surgery and Reconstructive Microsurgery, ASST Gaetano Pini – CTO, Milan, Italy; [2]Department of Orthopedics and Traumatology, University of Milan, Milan, Italy; [3]Clinic IV – Orthoplastics, IRCCS Rizzoli Orthopedic Institute, Bologna, Italy

Background: Phalangeal fractures remain a complex clinical challenge, with outcomes ranging from deformities to residual stiffness, regardless of treatment approach. The primary goals of treatment are to restore anatomical alignment and preserve hand function. Therefore, the choice of conservative or surgical treatment, including the method of reduction and fixation, should focus not only on bone restoration but also on the preservation of soft tissues.
Materials and Methods: Between January 1, 2017, and January 1, 2019, 72 patients with articular and extra-articular phalangeal fractures were treated surgically at our hospital using an external fixator for reduction and fixation, except for two patients who required open reduction. Of these, 59 patients (mean age 36 years) were selected for follow-up

at 1 and 5 years. At the 1-year follow-up, 45 patients responded, and 25 patients were evaluated at the 5-year mark. Patients were divided into two groups: Group A (articular fractures, 24 patients) and Group B (extra-articular fractures, 22 patients). Group A was further subdivided based on the fixation method: A1 (Joshi external fixator, 19 cases), A2 (Suzuki frame, 4 cases), and A3 (external fixator combined with a percutaneous screw, 1 case). Group B was treated exclusively with Joshi external fixators. Due to the COVID-19 pandemic, follow-up was conducted remotely via radiographic reviews, video evaluations of clinical parameters, and telephone Quick DASH questionnaires. A second follow-up was conducted by phone at 5 years.

Results: Radiographic healing was achieved in 98.31% of cases, with only one patient (1.69%) developing nonunion and requiring reoperation. The average Quick DASH score at 1 year was 14.1/55 for Group A and 14.3/55 for Group B. Overall satisfaction scores were 74/100 for Group A and 81/100 for Group B. In Group A, 79% of patients were able to form a full fist, while in Group B, 90% could achieve the same.

At 5 years of follow-up, the average Quick DASH score was 6.6/55 for Group A and 8/55 for Group B. Overall satisfaction scores were 95/100 for Group A and 82/100 for Group B

Conclusions: At the 1-year follow-up, slightly better results were observed in patients with extra-articular fractures, although no significant correlation was found between fracture type, treatment method, and outcomes based on clinical parameters and patient-reported outcomes (PROMs). At the 5-year follow-up, results were largely comparable between the groups.

While no gold standard exists for treating phalangeal fractures, our findings suggest that appropriate soft tissue management and early mobilization are essential for functional recovery. We conclude that percutaneous fixation, particularly with the Suzuki frame method, provides satisfactory outcomes even in articular fractures.

A-0908 INFLUENCE OF SOCIOECONOMIC FACTORS ON PREVALENCE OF SURGICAL TREATMENT OF CARPAL TUNNEL SYNDROME

Elin Bergsten[1,2], Lars B Dahlin[2,3,4], Mattias Rydberg[2,3], Malin Zimmerman[1,2]

[1]Department of Orthopedics, Helsingborg Hospital, Helsingborg, Sweden; [2]Department of Translational Medicine-Hand Surgery, Lund University, Lund, Sweden; [3]Department of Hand Surgery, Skåne University Hospital, Malmö, Sweden; [4]Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden

Introduction: Carpal tunnel syndrome (CTS) can be effectively treated with bracing and/or decompression surgery. However, there is limited knowledge about the impact of socioeconomic factors on the treatment regime for CTS.

Aim: To examine the impact of socioeconomic factors on non-surgical/surgical treatment for CTS.

Material & Methods: Data on sex, age, CTS diagnosis, and surgical treatment were collected from the Skåne Healthcare Register (SHR), Sweden, between 2004-2019 and crosslinked with socioeconomic data (i.e., level of education, social assistance, yearly earnings, and unemployment) from Statistics Sweden, using each Swedish citizen's unique national personal identity number. The socioeconomic data was assessed at the year of CTS diagnosis. Yearly earnings were divided into low, middle, and high income. The level of education was divided into three categories according to the International Standard Classification of Education (ISCED). Adjusted Cox regression models were employed to calculate hazard ratio (HR) (95% confidence interval, CI) for surgical treatment and to assess impact of sex, age, level of education, earnings, unemployment and social assistance on the likelihood of undergoing surgery for CTS.

Results: Among 34,868 participants, 23,713 (68%) were women, and 11,155 (32%) were men with an education distribution of primary level of education 25.3%, upper secondary education 49.2%, and tertiary level of education 24.1% (missing

data 1.4%). Only 2,216 (6.4%) participants received social assistance, while 10.5% were unemployed during the year of CTS diagnosis (1,897 (5.4%) participants were unemployed for 90 days or more). Women were more likely to undergo surgery for CTS compared to men [1.07 (1.03–1.10, p <=0.001)]. Age was a significant factor, with each additional year of age increasing the likelihood of undergoing surgery [1.01 (1.01–1.01, p < 0.001)]. Upper secondary education was associated with an increased likelihood of surgery [1.05 (1.02–1.10, p = 0.006)]. However, tertiary education was associated with a decreased likelihood of undergoing surgery [0.84 (0.80–0.88, p < 0.001)]. Higher income increased the likelihood of surgery [middle-income 1.10 (1.05–1.15, p < 0.001); high-income 1.19 (1.14–1.24, p < 0.001)]. In contrast, participants receiving social assistance had a lower likelihood of undergoing surgery [0.83 (0.77–0.89, p < 0.001)]. Unemployment also decreased the likelihood of surgery [unemployed <90 days at year of CTS diagnosis 0.90 (0.84–0.98, p = 0.009); unemployed >90 days 0.92 (0.86–0.99, p = 0.036])

Conclusions: Socioeconomic factors, such as income, education, unemployment and social assistance, highly influence the likelihood of undergoing surgery for CTS. Individuals with higher income, upper secondary education level, not receiving social assistance and with employment were more likely to receive surgical treatment. Tertiary education level was associated with a decreased likelihood of surgery. Targeted healthcare strategies are necessary to address disparities in CTS treatment access and ensure equitable care for patients from different socioeconomic background, but the mechanisms behind disparities are unknown.

A-0909 LONG TERM REVIEW OF A TWO-STAGE TECHNIQUE USING A JOINT DISTRACTING EXTERNAL FIXATOR FOR THE MANAGEMENT OF SEVERE DUPUYTREN'S CONTRACTURE INVOLVING THE PIPJ

Abigail Logan[1,2], Feiran Wu[1,2], Shakir Hussain[1], Tooba Arif[3], Subodh Deshmukh[1,3]

[1]Royal Orthopaedic Hospital, Birmingham, UK; [2]Queen Elizabeth Hospital, Birmingham, UK; [3]Birmingham City Hospital, Birmingham, UK

Introduction: Management of severe and longstanding Dupuytren's contracture remains a challenging problem, with secondary contracture of the joint capsule and ligaments frequently preventing complete correction of deformity. We propose a technique of employing a dorsal external fixator to provide continual proximal interphalangeal joint traction prior to definitive surgery.

Aim: To critically analyse the outcomes of a two-stage traction technique for treatment of Dupuytren's contracture.

Material & Methods: A retrospective study of patients who underwent a two-stage dynamic traction correction of severe Dupuytren's disease, with a minimum of 24 months follow-up, between 2001 and 2018 at two institutions was performed. Pre-operatively patient demographics such as smoking status, alcohol intake, associated conditions and any previous interventions were recorded. Patients included had a true PIPJ contracture of a minimum of 60 degrees (median: 90, IQR: 80-92.5) and underwent a comprehensive follow-up of at least 24 months, with the true flexion deformity recorded at each appointment.

The intervention occurred in two stages:

1) Stage 1: Application of a PIPJ joint distracting Mini orthofix for 2 weeks (patient self-distracting 1/2mm to 1 mm per day), followed by

2) Stage 2: Partial fasciectomy (in primary cases), or Dermofasciectomy and full thickness skin graft from the same side Elbow flexion crease (in revisional case), occurring exactly 2 weeks after Stage 1.

Digits were graded according to the Tubiana system both pre- and post-operatively, with the Tubiana coefficient used to assess the success of definitive surgery. Functional outcomes were collected via a DASH score pre and post-operatively.

Results: Between 2001 and 2018, 89 digits were operated on in 78 patients. Of these, 52 digits in 44 patients (58%) completed the 24-month follow-up period. Full intra-operative correction was achieved in 42 digits, with the remaining ten digits experiencing a residual contracture of 10-30 degrees. A recurrence (defined as an increase in contracture of any involved joint of more than 20degrees) occurred in 22 digits (42%) within the 24 month follow-up period; 25% of the recurrences occurred between 18-24 months post-op. Of the recurrences, 9 (41%) had undergone previous procedures for their contractures which had failed, prior to their definitive surgery using this technique. At final follow-up, despite the recurrences, 50 digits (96%) had maintained an improved Tubiana classification of at least 1 grade . Median pre-op DASH score was 25.5. Median 24 month post-op DASH score was 9.10. There is a median reduction of 16.4 DASH points post intervention.
Conclusions: We conclude that this two-stage dynamic traction technique improves overall outcomes in the treatment of severe Dupuytren's disease.

A-0910 LONG TERM RESULTS OF HAMMOCK SUSPENSIONPLASTY COMBINED WITH LIGAMENT RECONSTRUCTION THROUGH BONE TUNNELS WITH APL GRAFT FOR THUMB CMC JOINT ARTHRITIS

Akif Muhtar Öztürk, Mustafa Yasin Hatipoglu, Gökberk Baki, Salih Erdem, Muhammet Ozsoy, Hilmi Burak Sengul
Gazi University, Faculty of Medicine, Department of Orthopaedics and Traumatology

Introduction: There are numerous forms of surgical techniques for management of thumb carpometacarpal joint osteoarthritis. Basically trapeziectomy, ligament reconstruction and hamate suspensionplasty are main components of these various techniques.
Aim: This study aims to observe long term subsidence of first metacarpal base and functional results of our modified technique.
Material & Methods: At our instution between 2006 and 2023 175 patients were undergone; dorsal trapeziectomy, ligament reconstruction with radial APL slip through bone tunnels at bases of thumb and index finger metacarpal bases, and hammock suspensionplasty by interweaving APL graft slip between FCR and intact APL. Postoperative thumb plaster splint at functional position was used for 6 weeks.
Results: Preoperative measured trapezial height is compared with postoperative trapezial space height for evaluation of subsidence. Mean preoperative measured trapezial heigh was 11.3 mm (range15,5-6,7 SD1,03) and mean postoperative trapezial space height was 8,61 mm (range 17,7 -3,1 SD2.15). Functional evaluation will be completed by key pinch, grip strength measurements, range of motion evaluation, and DASH-T questionnaire.
Conclusions: Our modified technique, Hammock Suspensionplasty combined with Ligament Reconstruction Through Bone Tunnels with APL Graft for CMC arthritis management proves to keep trapezial space height acceptable limits.

A-0911 THE USE OF THE 4TH EXTENSOR COMPARTMENTAL VASCULARIZED BONE GRAFT FOR TREATMENT OF KIENBÖCK'S DISEASE AND TIPS FOR THE APPROPRIATE CAPSULOTOMY. CADAVERIC AND CLINICAL STUDY

Frantzeska Zampeli, Panagiotis Karras, Orestis Paliaroutas, Pavlos Panagiotou, Panagiotis Kanellos, Emmanouil Fandridis
Hand-Upper Limb-Microsurgery Department, General Hospital KAT, Kifisia, Attica, Greece

Introduction: An appropriate capsulotomy is required when performing lunate revascularization with vascularized bone graft (VBG) based on 4th extensor compartment artery (4th ECA).

Aim: The feasibility and effectiveness of a modification of Mayo capsulotomy that preserves the dorsal intercarpal arch (DICA) and the anastomotic vessel (AV) that provide retrograde blood flow to the 4th ECA VBG were tested in a combined cadaveric and clinical study.
Material & Methods: A radially based capsular flap was tested in eight freshly frozen cadaveric hands for the following characteristics: 1. The dorsal radiocarpal ligament (DRCL) limb of the capsulotomy should aim to preserve the AV and 4th ECA, and 2. the dorsal intercarpal ligament (DICL) limb should preserve the DICA.
Five patients (median age 31years, range 27-37) with Kienböck's disease (3 Lichtman stage II, 1 stage IIIA, and 1 stage IIIB) treated with this technique were prospectively evaluated.
Results: For all cadaveric specimens, the 4th ECA ended up at the dorsal capsule just distally to the radiocarpal joint and ulnarly to Lister tubercle. Distally to this point the AV with the DICA and the course of the AV were not visible (intracapsular course). The DRCL limb of the capsulotomy should start ulnarly to both the Lister tubercle and the point that the 4th ECA ends in the dorsal capsule and should extend to the triquetrum. The capsulotomy then continues in parallel to the EDQ sheath. The DICL limb should extend enough distally, parallel to the level of 2nd/3rd carpometacarpal joint to protect the DICA, since the latter was not visible on the capsule in none of the specimens, but has a known intracapsular course. At median follow-up of 45 months (range, 42-47) pain VAS score improved from 7.3 (7-8) to 2 (1-3), ROM improved from 63° (55-70) to 79° (69-84) for flexion-extension, and from 18º (10-27) to 29º (15-35) for radial-ulnar inclination. The average Modified Mayo Wrist Score improved in 75 (65-85) from 55 (50-65). Evidence of lunate revascularization was shown 6 months postoperatively in MRI for all patients. Radiological progression of disease from stage II to IIIB was noted for one patient. No donor side morbidity neither wrist joint instability was noted.
Conclusions: The proposed capsulotomy allows for lunate approach, harvesting and positioning of the VBG and preservation of the retrograde blood flow of the 4th ECA VBG. The technique allowed for lunate revascularization and functional improvement in patients with Kienbock stage II-IIIB

A-0912 INSIGHTS INTO TENDON TRANSFER PROCEDURES

Percin Karakol, Serhat Burak Örenel, Oguzhan Tekin, Ömer Büyükkaya, Mert Musa Tapkı
Health Sciences University, Başakşehir Çam and Sakura Cityhospital, Plastic Reconstructive and Aesthetic Surgery, Istanbul

Purpose: Tendon transfer is a surgical procedure used to restore lost or impaired function in patients with nerve injuries, muscle imbalances, or other functional deficits. This study aims to analyze the indications, techniques, and outcomes of tendon transfer surgeries to highlight their role in improving hand function and overall quality of life.
Material & Methods: A case of tendon transfer performed for Radial Palsy in March 2023 was retrospectively evaluated. The procedure performed was PT->ECRB, FCR->EDC, and PL->EPL transfers, also known as the triple Green transfer. Preoperative evaluations included assessments of muscle strength, joint mobility, and degree of functional loss. The patient underwent personalized rehabilitation programs after surgery, emphasizing range of motion exercises and strengthening. Data were collected on recovery time, complications, and functional outcomes.
Results: Successful functional recovery was achieved in our case, with significant improvements in muscle strength, range of motion, and hand function. In our radial nerve palsy case, recovery was seen with effective wrist and finger extension. No complications such as wound infection or tendon adhesion were observed in the case. The approximate recovery time was 12 weeks.
Conclusions: Tendon transfer is a safe and effective surgical technique for restoring hand function in patients with deficits associated with nerve injuries or trauma. The selective use of PT, FCR, and PL transfer offers significant advantages,

including reduced donor site morbidity and excellent functional outcomes. Success relies on meticulous preoperative planning, surgical precision, and comprehensive rehabilitation. These findings reinforce the importance of tendon transfer as a valuable option for addressing functional loss in hand surgery.

A-0913 INTRANEURAL PRGF ENHANCES NERVE REGENERATION AND FUNCTIONAL RECOVERY IN SEVERE CARPAL TUNNEL SYNDROME: A PROSPECTIVE, RANDOMIZED CONTROLLED TRIAL

Sergi Barrera Ochoa, Jose Antonio Prieto Meré, Melissa Bonilla Chaperón, Luis Donaldo Fuentes Ramirez, Andrés Alvial San Martín
Institut de la Ma, Barcelona, Spain

Introduction: Severe carpal tunnel syndrome (CTS), defined pre-operatively by nerve conduction velocity (NCV) < 30 m/s on EMG, significantly impacts quality of life. Surgical release, while standard, yields variable outcomes.
Aim: This RCT investigated whether adding intraneural PRGF (Plasma Rich In Growth Factors) improves outcomes.
Material & Methods: This prospective RCT compared carpal tunnel release with (n=39) and without (n=44) a single 3 mL intraneural autologous PRGF-Endoret injection (standardized protocol). Permuted block randomization stratified by sex ensured group balance. Baseline demographic data showed no significant intergroup differences. Pre- and postoperative (3, 6, and 12 months) assessments included EMG (NCV, CMAP), quantitative sensory testing (QST; VDT, WDT, CDT), pain (VAS, NRS), and functional status (BCTQ SSS & FSS; QuickDASH)
Results: All 83 participants completed the 12-month follow-up. The PRGF group showed statistically significant ($p<0.01$) improvements versus controls at 12 months in NCV (mean increase 5.2 m/s, 95% CI: 2.8, 7.6; effect size [Cohen's d] = 0.75; greater in patients with baseline NCV <30 m/s), VAS (mean reduction 2.1 points, effect size = 0.80), BCTQ SSS (mean improvement 15 points, effect size = 0.92), BCTQ FSS (mean improvement 12 points, effect size = 0.78), and QuickDASH (mean reduction 18 points, effect size = 0.85). Similar significant improvements were seen at 3 and 6 months.
Conclusions: Intraneural PRGF is a promising adjunct to surgical carpal tunnel release for severe CTS. Further research should optimize PRGF dosage, identify optimal patient selection criteria, and evaluate long-term outcomes.

A-0914 USE OF REVERSE HOMODIGITAL ISLAND FLAP IN FINGERTIP RECONSTRUCTION

Ceren Cömert, Yasin Canbaz, Kadir Barış Tiryaki, Furkan Uysal, Mert Noyan Dabak
Basaksehir Cam and Sakura City Hospital, Plastic and Reconstructive Surgery Department, İstanbul, Türkiye

Introduction: The homodigital pedicled digital artery island flap is a useful alternative for defect repair in soft tissue defects of the fingertip and pulp, playing an important role in our clinical practice. This study aims to present our clinical experiences regarding the application of the reverse-flow homodigital island flap in cases presenting to our clinic with fingertip and pulp defects.
Material & Methods: In this study, cases with fingertip and pulp defects that presented to our clinic from April 2023 to October 2024, and underwent reverse-flow homodigital island flap surgery including proximal dorsal skin for defect closure, were evaluated. The flap is designed from the dorsolateral aspect of the proximal phalanx while preserving the arch formed by the anastomosis of both digital arteries at the distal interphalangeal joint. Then the flap is separated from the digital nerve, the digital artery is ligated, and the flap is reverse perfused based on the anastomotic arch and brought to the recipient's defect through a subcutaneous tunnel, where it is adapted to the defect. The donor site can be closed

with a full-thickness skin graft or primarily. A total of 6 cases were included in the study. All cases involved males patients. The average age was calculated as 48.5. All defects were secondary to trauma, and flap surgery was performed in the acute phase. In all patients, the pedicle of the homodigital island flap was ligated proximally, and the flap was designed by dissecting from the digital nerve. In 4 of the 6 patients, the donor site was closed with a full-thickness skin graft, while in 2 patients, the donor site was closed primarily. In the acute phase, short-term venous congestion was observed in 2 patients, which resolved without the need for additional intervention. No additional complications were noted. In the long term, the range of motion of the distal interphalangeal joint was found to be the same as that of the other fingers.
Results: The hand is a powerful tool for humans to manipulate their environment functionally. The reverse homodigital island flap is a reliable flap that provides adequate size and flexibility of pulp tissue and has various described variations. It stands out in soft tissue defects of the pulp in patients without bony and neurovascular injury. The homodigital island flap is a suitable choice for the appropriate patient group because it is a single-stage procedure that provides a vascularized, safe, flexible skin that achieves good cosmetic conformity and adequate pulp tissue size. The disadvantages of the homodigital island flap include the time required for cortical reorganization of sensation, donor site morbidity, and the need for surgical experience. In most patients, decreased arterial flow to the donor finger is observed, along with cold intolerance in the postoperative period.
Conclusions: Amputations of the pulp of the distal phalanx, especially when there is exposed bone, are quite challenging to manage. When replantation is not possible, the use of an island flap is an option that should be considered.

A-0915 INDUCED MEMBRANE TECHNIQUE (MASQUELET) FOR THE RECONSTRUCTION OF BONE DEFECTS IN UPPER LIMB. A PROSPECTIVE STUDY OF SIX CASES FROM A SINGLE UPPER LIMB CENTER

Frantzeska Zampeli, Georgios Tetsios, Ioannis Aifantis, Panagiotis Karras, Emmanouil Fandridis, Panagiotis Kanellos
Hand-Upper Limb-Microsurgery Department, General Hospital KAT, Kifisia, Attica, Greece

Introduction: The reconstruction of bone defects of the upper limb raises many challenges relating to the bone union of limited weight-bearing segments, the unique anatomic characteristics of forearm and the function of adjacent joints.
Aim: The aim of this study was to report the surgical methods and results of a monocentric continuous series of six patients treated with the induced membrane technique (Masquelet) applied to traumatic or infectious upper limb bone defects.
Material & Methods: Six patients (4 male) with a median age of 38 years (range, 26-73) presented with a bone defect of the humerus (3 cases) or one of two forearm bones (3 cases). Diaphyseal (6 cases) defects were secondary to traumatic segmental bone loss in 1 patient and to chronic non-union in 5 others. Four patients had an identified preoperative infection. One patient had previously undergone an unsuccessful treatment for their nonunion. Reconstruction was done by initial filling using a spacer with cement, followed by a cancellous bone graft within the induced membrane after two months.
Results: Radiographic bone union was achieved in 100% of patients (6/6). Shoulder and elbow functional outcomes were comparable to the contralateral side. For forearm defects median range of forearm rotation was 140 (range, 70-160deg). None of the patients needed revision surgery
Conclusions: The two-stage induced membrane technique represents an effective treatment option for acute traumatic bone loss as well as chronic fracture nonunions. The technique allows filling of a large bone defect of the upper limb, while avoiding vascularized bone autografts and their morbidity. In this series the technique yielded good outcomes for traumatic bone defects and septic or aseptic non-union. Cancellous bone stock was not a limit for these defects.

A-0917 ARTHROSCOPIC TREATMENT'S OF ACUTE SCAPHOID FRACTURES

Alberto Sagrbossa
Ist Clinico SAnna, Brescia , Italy

Introduction: Open or percutaneous reconstruction of acute scaphoid's fractures was associate with some cases of nonunion. Malunion with shortening, flexion or rotation deformities was common and crate the bases to arthritis evolution. The associate ligaments lesions was common with unclear role in healing and functional wrist results but with a foreseeable effect. The arthroscopic assistance in percutaneous screw (or k-wire) fixation seems to be an useful instrument for anatomical reconstruction and associate ligament evaluation and treatment.
Aim: Valuate the effectiveness advantages of arthroscopic assistance in scaphoid acute fractures treatment
Material & Methods: From 2018 68 patients with scaphoid fractures was treated with percutaneous fixation, 63 with screw (5 with k-wire) with arthroscopic assistance. 95% was male , the mean age was 27 (16-45), all patients was treated with post-op thermoplastic brace for 3 weeks (6 weeks for k-wire cases) and subsequently treated with specific hand therapist recovering protocol. The patients was clinically and x-ray evaluated at 40 days 3-6-12 months. 12 patients was evaluated with x-ray at 5 years of follow-up. The clinical evaluation was realized with DASH and PRWHE score.
Results: All the procedures was concluded by arthroscopy assistance , without open conversion requirement. 95,6 % patients achieved the healing, 3 patients do not presented radiographically evidence of healing at 1 years without pain and necessity of additional surgery. In 1 case was necessary removal of the screw for prominence with x-ray shortening healing of the fracture. The mean clinical healing time was 2,3 months (x-ray complete healing mean time was 3.5 months). Functional evolution was in line with open and percutaneous literature's results (DASH PRWHE). ROM was 96% of contralateral wrist.
In all the cases was evaluate the radio-carpal and mid-carpal joints, in all cases was evaluate the ligament and capsular integrity. Was observed 23 associated soft tissue lesions, 5 cases of scapholunate Geissler 4 lesions was treated in acute with reconstructions, 4 cases of TFCC lesions was treated in acute , 3 cases of TFCC lesions was delayed treated for DRUJ instability and pain. No x-ray sign of arthritis evolutions was observed (especially in 12 cases with 5 years of follow-up)
Conclusions: The arthroscopic assistance of percutaneous fixations of scaphoid fractures represent a valid instrument to achieve the anatomical reconstruction and associated ligaments lesions evaluation and treatment. The cartilage reconstruction visualization was optimal. The screw compression effect visualization was accurate and is possibile evaluate small rotational and shortening problems, the humpback deformities could be visualize but the evaluation of small humpback deformities sometimes couldn't feasible. The mean surgical time was acceptable after learning curve problems were solved and the unquestionable advantages in anatomical reconstructions and associated lesions evaluation justify a limitate surgical time increment.

A-0918 MULTIMODAL SCAR REHABILITATION - HCP´S AND EMPOWERED PATIENTS WORKING ON THE INTERFACE OF TRAUMA

Johanna Maria Passer
[1]wirkstation, Innsbruck, Austria; [2]Therapie & Training, Telfs, Austria

Introduction: Scars are a lasting interface between the present functional body and past lived trauma that reach beyond skin depth - treatment can be challenging for not only each patient and each trauma carry a different story, also each health care discipline offers a distinct - sometimes contrary - view on a patients condition and needs. Though the process

of the multimodal posttraumatic and post surgical scar rehabilitation may take up some time, patients stay with a lifelong reminder of the initial event and maybe of previous ones, too. These could cause functional restrictions, irritations or pain, limiting the persons ability in participation and ADL from right on or in a later stage

Aim: Knowing that no single approach is suitable for every individual, the aim is to offer tailored therapy including easy to access and if possible self-applicable methods for patients while raising awareness and synergies between HCPs to perform best practice evidence-based, evidence-informed and evidence-oriented treatment optionsMaterial & Methods: Inclusive look at musculoscelettal, myofascial and meridian anatomy (Stecco; Myers; Schleip; Taylor); neurological and biopsychosocial concepts (Moseley; Baxter; Jacobs; Kieverstein); and trauma therapy (Levine, Maté) to identify and choose interventions during in-house treatment and aftercare.

Results & Conclusions: The rehabilitation process should include a thorough anamnesis and a selection of individually designed interventions to meet patients specific needs during wound healing and maturation of the scar. Early-on selfcare instructions enable patients regardless their biopsychosocial setting to regain and maintain painfree function, activity, independence and quality of life.

A-0919 VASCULARIZED PROXIMAL HAMATE OSTEOARTICULAR AUTOGRAFT FOR RECONSTRUCTION OF NON SALVAGEABLE PROXIMAL SCAPHOID FRACTURES: A NOVEL TECHNIQUE

Ahmed Naeem Atiyya, Ahmed Mohamed Ashraf Rabie, Khaled Nabil Youssef, Hamdy Alnaggar, Ayman Hweidy
Ain Shams University, Cairo, Egypt

Introduction: Achieving surgical union of the proximal pole of scaphoid fractures is challenging, particularly in the presence of unsalvageable fragmentation or AVN. Several techniques were described for such a perplexing problem with variable pros, cons, and success rates. Elhassan and colleagues** devised an innovative technique utilizing the proximal hamate (non vascularized) for reconstruction of scaphoid bone proximal pole non union with AVN. We modified Elhassan technique to harvest the proximal hamate as a vascularized pedicled flap for unsalvageable non-united avascular proximal pole scaphoid fractures. We hypothesize that this technique will give enhanced union rate with favorable functional and radiographic results.

Aim: To evaluate the short- term functional and radiological results of the index technique.

Material & Methods: We utilized this novel technique in seven cases of non-united avascular proximal pole scaphoid fractures (One case was excluded due to damage of the pedicle intraoperatively leaving a total of six patients to complete the study). Five patients were males with an average age of 26 years. Four patients were smokers. The left non dominant hand was affected in four patients. The duration of the nonunion averaged 51 months. Through a dorsal wrist approach, the proximal hamate was harvested as a pedicled osteoarticular flap. The pedicle was based on a branch of the dorsal intercarpal arch in 5 cases and nourished by a nutrient from the fifth extensor compartment artery in one case. Vascularity of the hamate was confirmed intraoperatively for the whole 6 cases. Fixation was obtained by mini-Herbert screws and augmented by K wires in 4 cases. Outcome measures were; rate and time to union, visual pain scale, range of motion of the wrist, and modified Mayo wrist scoring system.

Results: The follow-up period averaged 26 months. Union was achieved in all cases in an average of 15 weeks. Pain scale and range of motion (except volar flexion) improved postoperatively. Mayo wrist scoring system was rated excellent in 1 case, good in 4 cases and fair in 1 case

Conclusions: At the short term, the pedicled proximal hamate transfer yielded satisfactory results. It may be a promising technique in the armamentarium treating unsalvageable proximal pole scaphoid fractures. However, larger scale studies

are needed to demonstrate consistent favorable outcome.
Reference: ** : Elhassan B, Noureldin M, Kakar S. Proximal scaphoid pole reconstruction utilizing ipsilateral proximal hamate autograft. HAND.2016;11(4):495-499.

A-0920 FOUR CORNERS ARTHRODESIS: HEADLESS CANNULATED SCREWS VS PLATE

G. Cammelli, G. Caruso, E. Francioni, L. Martini, B. Redl, A. Vitali, PG. Zampetti
Azienda USL Toscana Centro Ospedale Piero Palagi, Firenze, Italy; Azienda Ospedaliera Universitaria Careggi, Firenze, Italy

Introduction: Four corner fusion (FCF) is a reliable operation used for different types of osteoarthritis of the wrist. Two mainstay surgical options for fusion are available: using dedicated plate or cannulated headless screws.
Aim: The aim of the study is to evaluate the effectiveness of the two different techniques.
Material & Methods: We retrospectively reviewed patients who underwent FCF between 2017 and 2023. We identified a total of 7 patients treated with screws and 10 with plates. Patients were reviewed at 15 days, 1,3,6 months and at final follow up. Pain, range of motion of long fingers and thumb, grip strength, subjective outcomes, time to union, time to return to work and complication rate were recorded.
Results: We did not find significant differences in terms of time objective and subjective outcomes among the two groups.
Conclusions: Both four corner fusion performed by screw and by plate have been utilized with comparing functional results, but we saw that the four corner fusion made by screws is significantly cheaper than the plate.

A-0921 TREATMENT OF DISTAL RADIUS MALUNION WITH CORRECTIVE OSTEOTOMY GUIDED BY 3D-PRINTED PATIENT-SPECIFIC INSTRUMENTS (PSIS) - PEARLS AND PITFALLS TO MINIMIZE COMPLICATIONS. CASE REPORT

Frantzeska Zampeli, Lydia Stylianopoulou, Orestis Paliaroutas, Panagiotis Kanellos, Vasiliki Tsiampa, Emmanouil Fandridis
Hand-Upper Limb-Microsurgery Department, General Hospital KAT, Kifisia, Attica, Greece

Introduction: One of the indications of 3D printing technology in orthopaedic surgery is the correction of deformation by using patient specific instruments and implants. Deformation after distal radius malunion may result in decreased function and pain, which are the indications for corrective osteotomy.
Aim: A case of distal radius malunion treated with corrective osteotomy using 3D printing technology and PSI is presented. The difficulties that may appear during the surgery and tips to solve them are highlighted.
Material & Methods: A 45-year-old male patient presented with right distal radius malunion after conservatively treated extrarticular fracture 8 months ago. He appeared with painful limitation of flexion-extension, radial/ulnar deviation and pronation-supination motion. He displayed radial height 9.4mm, positive ulnar variance +5mm, dorsal tilt 20.2^0, and radial inclination 17^0. Corrective osteotomy in two planes was decided to correct the deformity. Osteotomy was performed through volar approach. Tricortical iliac bone autograft of predetermined dimensions and geometry was used based on the 3D model. Through the same skin incision, a plane radially to the radial artery allowed for better control of scarring and adhesions, control and inspection of dorsal radial surface, control of osteotomy, and facilitation of graft placement.
Results: The deformation was corrected radiologically with postoperative radial height 12.3mm (contralateral 13), negative ulnar variance 0.3mm (+0.6), volar tilt 3^0 (11.5), and radial inclination 23^0 (26.1). Postoperative range of motion was improved in 120^0 from 50^0 for flexion-extension (contralateral 155^0), in 30^0 from 10^0 for radial/ulnar deviation (40^0), and in 140^0 from 120^0 for forearm pronation-supination (170^0). Conclusions: Corrective osteotomy using 3D printing

technology and PSI displays satisfying outcomes after distal radius malunion. Through the same palmar skin approach, a different internal approach radially to radial artery after detachment of brachioradialis, allows for further soft tissue mobilization, direct inspection of the radial column and dorsal radius, and control of completeness of osteotomy dorsally. Facilitation of graft insertion at later stage is also an advantage.

A-0922 ARTHROSCOPIC PROXIMAL SCAPHOID NON UNION IN THE YOUNG ACTIVE PATIENTS: IS THERE A CONSENSUS?

Mahdi Siala
Hand to Shoulder Riviera Center, Nice, France

Introduction: Proximal scaphoid non unions occurs for a minority of patients in Schernberg Zone 1 but remain surgically demanding and results presents high variability.
Aim: to assess présence or absence of consensus through a litterature review and expert opinion around the world
Material & Methods: online questionnary targeted to wrist surgeons with arthroscopic experience all over the world
Results: In progress with investigation results in aprilConclusions: Determine trends among the many possible options regarding litterature review and expert opinions

A-0923 PRELIMINARY REPORT ON REVASCULARIZATION OF CRYOTREATED MALIGNAT BONE TUMOR SEGMENTS WITH VASCULARIZED FIBULA ON BIOLOGICAL RECONSTRUCTION

Akif Muhtar Öztürk, Murat Arikan, Emre Tepedelenli, Cem Ismail Gungor, Muhammed Ozsoy, Gokberk Baki
Gazi University, department of Orthopaedics and Traumatology, Ankara, Turkiye

Introduction: Extensive resection of long bones due to tumor surgery challanges surgeons for biological reconstruction alternatives. Cryotreatment of resected bone segment with-in liquid nitrogen and enhancement with vascularized bone flaps are new form of solution to this challanging situations.
Aim: This study aims to share our preliminary experience with this technique.
Material & Methods:Since 2022, 6 patients operated for malignant bone tumor resection were reconstructed with vascularized fibula flap combined with cryotreated resected bone segment. Primary diagnoses were Ewing sarcoma at 4 patients and remaining two patients were diagnosed as osteosarcoma. After appropriate tumor resection, recipient vassels were identified, and resected bone segment was reamed to 20 mm diameter for fibular insertion, afterwards it was dipped in liquid nitrogen for 25 min followed by thawing with-in distilled water at room temperature for 10 minutes. Afterwards harvested pediculed fibula is integrated to cryotreated bone segment and rigid stabilization achieved. Patient age was between 9-15, with a follow up period is between of 30 -8 months. Tumors were localized at femur, tibia and humerus.
Results: integration and revascularization with acceptable bone healing achiewed in all cryo-treated resected bone segmets. Functional evaluation and tumor followup tretaed extremities will be after recent evaluation.
Conclusions: Experience drawn from this small sized patient group with relatively short follow up period we can conclude revascularization of cryo-treated resected bones are safe and efficient biological reconstruction alternative for malignat tumor resection.

A-0924 UPPER VS. LOWER EXTREMITY INVOLVEMENT IN RHEUMATOID ARTHRITIS: EXPLORING DIFFERENCES IN PATIENT OUTCOMES - A PRELIMINARY STUDY

Büşra Durak, Çiğdem Ayhan Kuru
Hacettepe University, Faculty of Physiotherapy and Rehabilitation, Department of Rheumatological Physiotherapy and Rehabilitation, Ankara, Turkey

Introduction: Rheumatoid arthritis (RA) is a chronic, inflammatory, and autoimmune disease characterized by progressive joint inflammation. While typically affecting the small joints of the hands and feet symmetrically, the extent of involvement can vary, impacting both physical function and psychological well-being. Chronic pain, a hallmark of RA, significantly contributes to psychological distress, potentially leading to depression, anxiety, kinesiophobia, and pain catastrophizing. Furthermore, prolonged nociceptive input from inflamed joints is thought to induce central sensitization. Given the distinct functional roles of the upper and lower extremities, it is plausible that the location of joint involvement differentially impacts patients' outcomes. While the literature extensively documents the negative effects of RA on physical and psychological health, research directly comparing these outcomes based on specific extremity involvement is lacking.
Aim: This study aims to examine the relationship between upper and lower extremity involvement and key patient-reported outcomes. Understanding these relationships may inform targeted interventions and improve treatment strategies for individuals with RA.
Material & Methods: This cross-sectional study evaluated 44 individuals diagnosed with RA, aged between 18 and 65 years. Participants were recruited based on reported joint involvement, categorized as either upper extremity (n=13) or lower extremity (n=14) involvement. The mean age of the participants was 45.04 ± 14.35 years, with a mean BMI of 27.68 ± 5.74 kg/m^2. Demographic and clinical data, including age, BMI, educational level, marital status, smoking and alcohol use, current medications, and comorbidities, were collected. Joint involvement was determined based on participant self-report of tender and swollen joints, specifying the affected region (upper or lower extremity). A comprehensive assessment of pain, quality of life, and psychosocial factors was conducted using validated questionnaires. Pain intensity and quality were measured using the Short Form of the McGill Pain Questionnaire. Health-related quality of life was assessed with the Quality of Life in Rheumatoid Arthritis Scale. Central sensitization symptoms were evaluated using Central Sensitization Inventory- Part A. The biopsychosocial impact of RA was measured with the Cognitive Exercise Therapy Approach-Biopsychosocial Questionnaire. Feelings of helplessness were assessed using the Learned Helplessness Scale, while anxiety and depression symptoms were measured using the Hospital Anxiety and Depression Scale. Kinesiophobia and pain catastrophizing were evaluated using the Tampa Scale for Kinesiophobia and the Pain Catastrophizing Scale, respectively. Statistical analyses were performed using IBM SPSS Statistics version 23. A p-value of less than 0.05 was considered statistically significant for all analyses.
Results: No statistically significant differences were observed between the upper and lower extremity involvement groups regarding patient outcomes except CSI-A score. Individuals with upper extremity involvement reported significantly higher CSI-A scores (48.92 ± 18.87) compared to those with lower extremity involvement (34.64 ± 15.05), p=0.039.
Conclusions: This study reveals that upper extremity involvement in RA is linked to significantly higher central sensitization compared to lower extremity involvement. This finding may predict central sensitization based on joint location, informing targeted treatment strategies. Further research should validate these findings and explore underlying mechanisms, investigating targeted interventions for improved symptom management.

A-0925 THE HIDDEN DANGER OF MINOR TRAUMA: LYMPHOCUTANEOUS INFECTION BY NOCARDIA BRASILIENSIS

Claudia Castelló, Raquel Maroto-Rodríguez, Jose Sánchez, Mercè Font, Maria Tibau, Guillem Paz, María Fernanda Gómez, Andrés Pérez, Miguel Picallo
Mataró Hospital, Barcelona, Spain

Introduction: Nocardia is a genus of Gram-positive, filamentous, partially acid-fast bacteria belonging to the family Nocardiaceae. These organisms are ubiquitous in the environment, particularly in soil, water and organic matter, and can cause both opportunistic and primary infections in humans. Of over 50 identified species, approximately 20 are clinically relevant, with Nocardia Brasiliensis commonly associated with primary cutaneous infections, such as lymphocutaneous nocardiosis. This species predominantly affects individuals following direct inoculation during minor trauma.

Cutaneous nocardiosis can mimic other subcutaneous infections due to overlapping clinical presentations. However, Nocardia brasiliensis is distinguished by its propensity to produce purulent drainage, ascending nodular lymphangitis, and deeper soft tissue involvement, making these features key for differential diagnosis.

Objectives: To describe the clinical presentation, diagnostic approach, differential diagnosis, and treatment outcomes of two patients with lymphocutaneous cellulitis caused by Nocardia brasiliensis, highlighting the importance of a multidisciplinary approach.

Materials and Methods: This study discusses two cases of patients who presented to our Emergency Department with persistent cellulitis symptoms refractory to initial empirical treatment.

The first case was an 80-year-old woman who developed cellulitis and purulent drainage in the third finger of her right hand following minor trauma with a palm tree, accompanied by nodular lymphangitis extending to the forearm. The symptoms persisted despite empirical oral amoxicillin-clavulanic acid prescribed at a primary care center. The second case was a 63-year-old man who reported erythema and swelling of the second finger of his left hand after a gardening incident, later progressing to ascending lymphangitis involving the hand and forearm. Initial treatment with oral amoxicillin-clavulanic acid also failed to halt disease progression.

Initial clinical assessment included physical examination and imaging studies to evaluate the extent of infection. Ultrasound revealed subcutaneous abscesses and soft tissue edema without evidence of systemic dissemination or osseous involvement.

Results: Both patients required surgical debridement for infection control. In the first case, two procedures were necessary due to extensive involvement of the hand and forearm. The second case required a single debridement. Samples for microbiological analysis were obtained during surgical procedures. Microbiological cultures and special staining confirmed the presence of Nocardia Brasiliensis in both cases.

Initial empirical therapy was escalated to targeted treatment with trimethoprim-sulfamethoxazole (TMP-SMX) following microbiological confirmation. Both patients completed a three-month antibiotic regimen, achieving clinical resolution. Pulmonary and CNS CT scans were conducted, showing no abnormalities. Residual stiffness in the affected fingers required rehabilitation, which significantly improved range of motion and hand function.

Conclusion: This study presents two cases of lymphocutaneous cellulitis caused by Nocardia Brasiliensis following minor gardening-related traumas, a rare but important differential diagnosis in patients presenting with subcutaneous nodular lesions and ascending lymphangitis.

These cases highlight the importance of early diagnosis, prompt surgical intervention, and targeted antibiotic therapy. The variability in clinical manifestations highlights the importance of precise microbiological identification and a multidisciplinary approach involving infectious diseases specialists and hand surgeons for improving patient outcomes. While TMP-SMX remains the first-line treatment, further studies are needed to refine diagnostic and therapeutic strategies for nocardiosis in immunocompetent patients.

A-0926 MOTOR IMAGERY: A POTENTIAL THERAPEUTIC TARGET IN TRAPEZIOMETACARPAL OSTEOARTHRITIS?

Seda Koparan, Çiğdem Ayhan Kuru, Büşra Durak
Faculty of Physiotherapy and Rehabilitation, Orthopedic Physiotherapy and Rehabilitation Department, Hacettepe University, Ankara, Turkey

Introduction: Trapeziometacarpal osteoarthritis (TMC OA), also known as basal joint arthritis of the thumb, is the second most common degenerative joint disease affecting the hand. TMC OA causes pain, impairs hand function and mobility, and negatively impacts daily activities. Beyond these peripheral musculoskeletal effects, chronic pain can induce sensorimotor changes and central nervous system reorganization. Motor imagery (MI), a cognitive process involving the mental simulation of movement without physical execution, engages neural networks that overlap with sensorimotor regions. This engagement can increase activation in these areas and elicit corresponding electromyographic responses. MI has shown promise in understanding and treating pain, as well as improving motor learning and performance. While the influence of cognitive factors on various musculoskeletal conditions has been studied, their role in TMC OA remains unknown.
Aim: To investigate motor imagery ability in individuals with TMC OA and to investigate the relationship between motor imagery ability and pain intensity, grip strength and hand performance.
Material & Methods: This cross-sectional study included 35 individuals with TMC OA (age: 62.9 $\pm$ 7.7 years; BMI: 28.2 $\pm$ 4.23 kg/m^2). MI ability was assessed using the Kinesthetic and Visual Imagery Questionnaire, which comprises visual and kinesthetic imagery subscales. Pain intensity was measured using the Visual Analog Scale (VAS). Grip strength was measured using a JAMAR dynamometer, while hand dexterity and function were assessed with the Moberg Pickup Test (MPUT). Measurements were taken for both extremities. Statistical analysis was performed using IBM SPSS Statistics version 23 ($p < 0.05$ considered statistically significant). KVIQ scores were compared with the normative means by computing a Student-t test using Graphpad Software.
Results: The KVIQ-20 kinesthetic imagery subscale was significantly lower in the TMC OA group compared to healthy individuals (-8.9, 95% CI [-13.0005, -4.7995], $p < 0.0001$). The total KVIQ-20 score was significantly correlated with MPUT performance with both eyes open ($p < 0.003$) and closed ($p < 0.033$). The KVIQ-20 visual subscale was moderately correlated with MPUT performance with eyes open ($p < 0.006$). The kinesthetic subscale showed moderate correlations with pain intensity at rest ($p < 0.018$) and MPUT performance with eyes open ($p < 0.006$) and closed ($p < 0.008$).
Conclusions: Individuals with TMC OA demonstrated reduced MI ability compared to healthy individuals. Integrating interventions aimed at improving motor imagery ability into rehabilitation programs is recommended for individuals experiencing higher levels of pain. Enhancing motor imagery skills may also improve hand performance.

A-0927 FREE NON-VASCULARIZED HEMI-FIBULAR GRAFT FOR TREATMENT OF LARGE BONE DEFECT OF METACARPAL IN MANGLED INJURY OF THE HAND

Frantzeska Zampeli, Panagiotis Tsintavis, Georgios Chatzipanagiotou, Orestis Paliaroutas, Sophia Syngouna, Emmanouil Fandridis
Hand-Upper Limb-Microsurgery Department, General Hospital KAT, Kifisia, Attica, Greece

Introduction: Limited available graft options exist for the salvage reconstruction and treatment of bone defect of the hand including tricortical iliac grafting, vascularized or non-vascularized fibular grafting, or metatarsal grafting.
Aim: The aim of this study was to describe our experience in a case with large bone defect of metacarpal caused after a crush injury of the hand treated with free non-vascularized autogenous hemi-fibular bone graft.

Material & Methods: A 42-year-old male presented with mangled injury of the left hand caused by crush injury mechanism affecting the palm of the hand and index metacarpal region. Finger vascularity was confirmed and the full extent and degree of tissue destruction was verified upon initial surgical debridement and complete wound exploration. Copious irrigation and radical wound debridement removing all devitalized tissue revealed a bone defect of the diaphysis and head of second metacarpal as well as the proximal part of proximal phalanx with destruction of the metacarpophalangeal joint. Fracture stabilization with K-wire fixation offered a relatively stable environment, maintaining the length of the second ray. A second and third look debridement surgery were performed at 24 and 36 hours. Reconstruction of bone loss was managed by hemi-fibular grafting technique which involves selective osteotomy of the anterior half of the middle third of the fibula for the reconstruction of bone loss. The fibular bone graft was fixed at recipient site, proximally at 2nd metacarpal base and distally at proximal phalanx diaphysis, with 2 small fragment L and Y shaped plates respectively. The motion of the metacarpophalangeal joint was abolished.
Results: At 9 months follow up the patient showed graft union and incorporation and was free of infection. Although the metacarpophalangeal joint could not be reconstructed and was abolished, pain level was 1/10 (VAS score), DASH 35.8, and grip strength 70% of contralateral side
Conclusions: The management of a case of mangled hand injury with metacarpal bone defect by reconstruction using hemi-fibular grafting technique was shown. This technique has been used as an innovative technical substitute to the traditional methods of autograft harvesting, and has been used for GCT of metacarpals. Good regenerative potential at the donor site and good incorporation rates at the recipient site providing good functional results and satisfying maintenance of the esthetic appearance of the hand were shown. Free non-vascularized hemi-fibular graft can be chosen as treatment method for selective cases of crush or mangled injuries with large bone defect of metacarpal instead of primary ray amputation.

A-0928 SPANNING PLATE FIXATION FOR COMPLEX DISTAL RADIUS FRACTURE. CASE REPORT

Dimitrios Myrgiotis, Frantzeska Zampeli, Georgios Tetsios, Niki Tsoutsi, Filippos Giannoulis, Emmanouil Fandridis
Hand-Upper Limb-Microsurgery Department, General Hospital KAT, Kifisia, Attica, Greece

Introduction: Distal radius fractures (DRF) are the most common fractures of the upper extremity and occur in a bimodal age distribution. The ideal intervention depends on patient's and fracture's characteristics. Spanning plate fixation is gaining popularity nowadays in severely comminuted, intra-articular fractures.
Aim: We present a case report of comminuted intrarticular DRF treated with a dorsal spanning plate.
Material & Methods: A 68-year-old male patient presented at our institution after a fall from stairs. Upon presentation he had ilium and acetabulum fracture and a severely comminuted intra-articular DRF of his right hand. The DRF was surgically treated 20 days after the injury. Although initial effort to perform osteosynthesis with volar plating was attempted, the comminution of the fracture, lack of bone stock and the intrarticular involvement precluded the use of a volar plate. A dorsal spanning wrist plate was used for fracture fixation.
Results: Fracture union was achieved, and the plate was removed 12 weeks postoperatively. At final follow up 2 weeks after plate removal, the range of motion of the wrist was 57deg flexion, 48deg extension, 77deg pronation, 74deg supination, 15deg radial inclination, 19deg ulnar inclination. Mayo wrist score was 80%, and PRWE was 10
Conclusions: Dorsal spanning plate fixation provides an alternative option for treating complex distal radius fractures acting as an "internal external fixator" and functioning through ligamentotaxis for fracture reduction. In our case report, patient had good functional outcomes with no complications.

A-0929 CHRONIC IRREDUCIBLE VOLAR DISLOCATION OF THE DISTAL RADIOULNAR JOINT

Natalia Gutierrez Olivera, Maria Luz Paz, Carlos Alvarez, Gustavo Quevedo, Jorge Soutullo, Christian Allende Nores
Sanatorio Allende, Córdoba, Argentina

Introduction: Isolated distal radioulnar joint (DRUJ) dislocation is less common than those with fracture association. Volar dislocations of DRUJ are even rare, accounting for only 0.02% of all bone injuries. They are frequently misdiagnosed, 36% of cases initially missed, leading to persistent pain and significant functional limitation.

Aim: To present two cases of young male patients with chronic traumatic volar dislocation of the DRUJ, diagnosis and treatment.

Material & Methods: Case 1: A 31-years-old male, right hand dominant limb affected, veterinarian; presented to the hand clinics 3 months after a wrist trauma. He suffered a forced supination torsion sustained while handling cattle. He was treated with a short splint for 10 days followed by hand therapy. He persisted with pain and motion limitation. Examination revealed complete limitation of both active and passive pronation.

Case 2: A 16-years-old male, tennis player; sustained a left wrist trauma from a fall while playing tennis 6 weeks ago. He attended to a neighboring hospital; radiographs were assessed normal and he was placed in a splint. At 8 weeks he was unable to perform active and passive pronation or supination. His wrist was fixed in a mid-pronated position and there was a loss of dorsal prominence of the ulnar head.

Diagnosis: a slight subluxation was observed on lateral radiographs. Computed tomography (CT) scan showed the ulnar head was impacted against the anterior cortex of the radius in both cases (in Case 1, the ulnar head exhibited erosion caused by its impact against the volar margin of the sigmoid notch). Preoperative MRI revealed injury to the triangular fibrocartilage complex (TFCC).

Technique: A curvilinear "S" 5-cm skin incision was made between the fifth and sixth extensor compartments overlying the DRUJ. The Extensor Carpi Ulnaris (ECU) tendon sheath was injured. An L shaped capsulotomy was made in the DRUJ capsule. Interposed soft tissue was released. A mini-invasive cervical distractor was then applied to the DRUJ, allowing joint opening and reduction while minimizing further injury to the ulnar head. The TFCC was reattached at the fovea with an anchor and an extensor retinaculum reconstruction was performed to enhance the involvement of the ECU tendon in providing dorsal stability to the DRUJ.

Postoperatively, patients were immobilized in pronation for 3 weeks, followed by neutral positioning for an additional 3 weeks.

Results: Follow-up period was 9 months for Case 1 and 7 months for Case 2. Both patients were pain free at 6 months and returned to their usual activities. They recover functional movement and strength. However, Case 1 exhibited a persistent 20° loss of forearm pronation.

Conclusions: Isolated volar DRUJ dislocation is a rare injury. Failure to perform a true lateral radiograph may contribute to the injury being missed. In a patient with pain and lack of forearm rotation with no evidence of bone fracture we recommend to perform a CT scan. Open reduction is indicated for late presentation or diagnosis. A pre-op MRI is advised to identify soft tissue injuries and guide the approach.

A-0930 SURVEY: EDUCATION IN HAND SURGERY IN EUROPE

Jonathan Hobby[1], Camillo Fulchignoni[2], Elisabeth Haas[3]
[1]Hampshire Hospitals, North Hampshire Hospital, Basingstoke, Uk; [2]Policlinico Universitario A. Gemelli, Rome, Italy; [3]University Hospital, Ludwig Maximilian University of Munich, Germany

Introduction: Training in hand surgery varies widely in Europe and there is currently little evidence and no consensus as to the ideal hand surgery training program. This survey has been completed by the education committee to inform future initiatives.
Aim: To review the current training pathways in Europe, assess the satisfaction of surgeons with current training models and identify best practise.
Material & Methods: We performed an on line survey of training. A QR code was used at the Rotterdam meeting and a recent FESSH foundation course. The code was also e-mailed to FESSH delegates. The FESSH website, National websites and FESSH national delegates were used to clarify the training pathway in each country. The results were analysed in an Excel spreadsheet. A two tailed unpaired t-test was used for post hoc hypothesis testing.
Results: We received 147 responses, 10 from non FESSH member countries were excluded leaving 137 for analysis.
We received responses from 28/29 FESSH societies. There were 17 trainees and 120 trained surgeons.
Training pathways varied considerably between Nations.
Two Nations recognise hand surgery as a speciality and have a dedicated program, three have a specific program including other surgical disciplines, 14 have a specific postgraduate program for hand surgery training after board certification in a parent speciality and 10 nations have no defined program. Four nations do not have microsurgery courses.
Overall satisfaction with training was 3.6/5
Satisfaction was significantly higher in those in dedicated hand surgery training 4.2 vs 3.5 ($p = 0.01$)
Speciality training was considered sufficient by 29 (21%), completed following a fellowship by 56 (41%) and incomplete by 52 (38%). 65/105 (62%) had completed a hand surgery fellowship
Completing a fellowship was considered important 4.5/5, it was considered more important by orthopaedic trainees then others 4.8 vs 4.3 ($p=0.003$)
Completing an exam was considered important 4.3/5, there was no difference between specialities.
7 Nations have a mandatory hand surgery exam, 4 require EBHS, 9 have an optional exam and 9 do not have an exam.
Surgical logbooks were mandatory for 85 (62%), optional for 21 (15%) and not required for 31 (23%)
Conclusions: Hand surgery training and accreditation varies widely across Europe. Additional postgraduate fellowship training is considered important, particularly in those Nations in which hand surgery training is completed after accreditation. We have identified opportunities to improve training, which vary between nations; and those with less developed training pathways may benefit from increased support from FESSH.

A-0931 DISTAL SCAPHOID ARTHROSCOPIC RESECTION WITH OR WITHOUT AN ASSOCIATED DORSAL CAPSULOPLASTY FOR SCAPHOTRAPEZIOTRAPEZOID OSTEOARTHRITIS

Julia Benitez[1], Aritz Ortega[1], Rosa Morro[2,3], Manuel Llusa[3,4], Joaquim Casañas[1,4]
[1]Hospital Universitari de Bellvitge, Barcelona, Spain; [2]Hospital Universitari Vall d'Hebron, Barcelona, Spain; [3]Anatomy Department, Faculty of Medicine, Universitat de Barcelona, Barcelona, Spain; [4]Hospital Médico Teknon, Barcelona, Spain

Introduction: Despite its high prevalence, there is no consensus in the surgical management of scaphotrapeziotrapezoid osteoarthritis.

Aim: Scaphotrapeziotrapezoid osteoarthritis patients can benefit from distal scaphoid arthroscopic resection. We consider that an additional dorsal capsuloplasty can prove useful in cases of SOAC wrist with scapholunate ligament injury but without midcarpal pain nor lunocapitate subluxation with axial force.
Material & Methods: We present a retrospective study of 34 patients, aged between 41 to 78 years old, operated between 2010 and 2024 by wrist arthroscopy. In all cases, resection of the distal pole of the scaphoid was performed. Dorsal capsuloplasty was additionally conducted in 9 patients who presented a SOAC wrist with evidence of scapholunate ligament injury but no prior midcarpal pain at physical examination nor lunocapitate subluxation.
Results: Average active range of motion for volar flexion of 60º and dorsal flexion of 30º. Complications included injury of radial or ulnar sensitive branches (2), delayed rupture of tendon extensors (1), incomplete resection of the distal pole with need of a revision surgery (5), progression of midcarpal instability with need of a lunocapitate arthrodesis (3). No differences regarding complications were noticed between both groups (resection with or without dorsal capsulodesis).
Conclusions: We consider distal scaphoid resection a good treatment option for STT osteoarthritis patients. Additional surgical gestures, like dorsal capsuloplasty, might provide a supplementary benefit in selected cases. However, longer follow-up is necessary to assess long term benefits from dorsal capsuloplasty compared to distal pole scaphoid resection only.

A-0932 NERVE TRANSFERS FOR PARSONAGE-TURNER SYNDROME: OUR EXPERIENCE

Julia Benitez[1], Aritz Ortega[1], Rosa Morro[2,3], Manuel Llusa[3,4], Joaquim Casañas[1,4]
[1]Hospital Universitari de Bellvitge, Barcelona, Spain; [2]Hospital Universitari Vall d'Hebron, Barcelona, Spain; [3]Anatomy Department, Faculty of Medicine, Universitat de Barcelona, Barcelona, Spain; [4]Hospital Médico Teknon, Barcelona, Spain

Introduction: Parsonage-Turner syndrome, also known as amyotrophic neuralgia or idiopathic brachial plexopathy, has no established treatment. Although the majority of patients recover spontaneously, chronic pain and functional deficits persist in one-third of the cases.
Aim: The aim of this study is to present and evaluate the results of nerve transfers as a treatment option for patients with no spontaneous recovery.
Material & Methods: We report a series of eleven patients, 8 men and 3 women, aged between 26 and 68 years-old with persistent symptoms after 6 months from diagnosis. One patient was a recurrence case.
The delay between the onset of symptoms and surgery was 6 to 17 months.
All patients were treated surgically with nerve transfers (radial to axillary, Oberlin or thoracodorsal- long thoracic nerve transfer). Intraoperative neurophysiological monitoring was used in all cases. End-to-end or reverse-end-to-side (RETS) suture was chosen depending on the severity of the donor nerve injury.
Results: Functional recovery was obtained in ten patients, achieving a muscle strength up to M4-M5. Only one patient, who underwent a radial-axillary nerve transfer, did not improve with surgical treatment
Conclusions: Parsonage-Turner syndrome patients with persistent symptoms can benefit from surgical treatment with nerve transfers, on many occasions by using a RETS suture. In these patients, EMG muscle fibrillation can persist for a long time, and the long thoracic nerve is usually severely injured.

A-0933 POSTERIOR INTEROSSEOUS NERVE COMPRESSION IN THE FOREARM. CLINICAL PRESENTATION AND SURGICAL TREATMENT

Frantzeska Zampeli, Sophia Syngouna, Eleni Pappa, Giorgos Tetsios, Panagiotis Kanellos, Vasiliki Tsiampa, Emmanouil Fandridis

Hand-Upper Limb-Microsurgery Department, General Hospital KAT, Kifisia, Attica, Greece

Introduction: Posterior interosseous nerve (PIN) compression at the forearm may present with a continuum of varying clinical presentations ranging from pain at the proximal dorsal forearm to motor weakness or paralysis of finger extension at metacarpophalangeal (MCP) joints and wrist extension/ulnar deviation.

Aim: This retrospective study evaluated the clinical presentation and outcomes following surgical decompression of the PIN in the forearm.

Material & Methods: After excluding patients with polyneuropathy, neurologic or rheumatology disease, the study reviewed results of 25 patients (13 female), mean age 38years (range, 38-60) following PIN decompression between 2018 and 2023 by a single surgeon. Data collected included: clinical presentation, functional outcomes, imaging and electrophysiology studies, and Disabilities of the Arm, Shoulder, and Hand (DASH) scores. Clinical presentation included pain over radial tunnel or dorsal proximal forearm, pain at distal forearm over radial sensory nerve, motor weakness (finger MCP extension, wrist extension in ulnar deviation) or motor paralysis. Lateral epicondylitis was present in 7 patients.

Results: Mean time of symptoms' duration before surgery was 3,5 months (range, 2-11). Posterior approach was used for 15 and anterior for 10 cases. Soft tissue mass (lipoma) was the cause of compression in 3 patients. For 22 patients all the sites of compression found were released including: arcade of Frohse, leash of Henry, tendinous proximal border of ECRB, and the distal border of the supinator. Finger extension was improved for 20 patients within 2-7 months. Five patients had no improvement and 3 of them were re-operated with tendon transfers. At mean follow up 30 months (range, 12-61) there were significant improvements in Visual Analog Scale pain scores (from 7 to 2, $P < 0.001$), and DASH scores (from 57 to 31, $P<0.01$)

Conclusions: The PIN compression in the forearm requires careful clinical examination and prompt differential diagnosis. Surgical decompression provides significant improvement in pain, motor recovery, and functional outcome in patients with persistent symptoms, without improvement after nonoperative treatment.

A-0934 OUTCOMES OF THE FIRST DORSAL METACARPAL ARTERY FLAP FOR COMPLEX SOFT TISSUE INJURIES OF THE THUMB

Muhammet Okkan[1], Şuayip Akıncı[2], Elyesa Ergen[3], Zeynel Mert Asfuroğlu[3]

[1]Konya City Hospital, Konya, Turkey; [2]Van Training and Research Hospital, Van, Turkey; [3]Mersin University, Mersin, Turkey

Introduction: Large complex pulp defects that expose the tendons, bones and joints of the thumb are challenging reconstructive problems due to the lack of locally available tissue. The First dorsal metacarpal artery (FDMA) flap, innervated from the dorsum of the index finger, was first described by Hilgenfeldt and Holevich. Later, Foucher and Braun designed an island flap (kite flap) which is raised on a neurovascular pedicle containing the FDMA and associated vessels and a branch of the superficial radial nerve.

Aim: The aim of this study is to present the advantages, safety and functional results of the sensory innervated FDMA flap used in complex soft tissue defects of the thumb.

Material & Methods: The study included 12 patients who underwent FDMA flap between August 2022 and June 2024. The mean age of the patients was 46.2 years. Mean follow-up was 9.4 (5-12) months. The number of days after injury was 11.8

(1-37). Sensory function was assessed by Semmes-Weinstein monofilament (SWMF) and static 2-point discrimination (s2-PD) tests. An analogue scale was used to subjectively assess paresthesia (0 = no paresthesia, 4 = severe paresthesia), pain and cosmesis of the flap and donor site (0 = worst cosmesis, 10 = best cosmesis). Cold intolerance was measured using the Cold Intolerance Severity Score (CISS). First ray mobility was assessed using the Kapandji score. Functional outcome was assessed using the Michigan Hand Outcomes Questionnaire (MHQ) score. At the last follow-up, active range of motion (ROM) was measured with a goniometer.

Results: The mean time to return to work was 44.8 (18-63) days. At the last examination, the SWMF test for the affected side was 1.5 gr. and the s2-PD test was 5.25 mm. There was no statistically significant difference from the unaffected side. The paresthesia score was 0.83 in the flap and 0.91 in the donor site. Pain score was 1.6 in the flap and 0.75 in the donor site. The flap cosmetic score was 8.3 and the donor site cosmetic score was 8.6. CISS score was 8.3 and MHQ score was 86. The Kapandji index was 8.5 on the affected side, while there was no statistically significant difference between the two on the unaffected side. Active ROM values on the affected side were 95.9° and 82.6° at the MCP joint and proximal interphalangeal (PIP) joint of the second finger and 55° at the metacarpophalangeal (MCP) joint of the thumb, respectively. There was no statistically significant difference between these and the unaffected side. 2 patients developed focal necrosis and 1 patient developed total necrosis. Infection was observed in 2 patients.

Conclusions: The FDMA flap has low donor site morbidity. It shows good functional and aesthetic results. The absence of microsurgical vessel or nerve dissection facilitates surgery, shortens its duration and reduces morbidity, while allowing restoration of thumb innervation. FDMA local fingertip flaps should be the surgeon's first choice for thumb soft tissue defects that cannot be treated with secondary healing or grafts.

A-0935 USE OF BETA TRICALCIUM PHOSPHATE (B-TCP) GRAFT FOR PATIENT SPECIFIC DISTAL RADIUS OSTEOTOMIES COMPARED TO AUTOLOGOUS OR NO BONE GRAFT

Soha Sajid[1], Omar Mostafa[1], Akshay Malhotra[2], Simon Pickard[3]

[1]Dudley Group of Hospitals, Dudley, UK; [2]University Hospitals of North Midlands, Stoke-on-Trent, UK; [3]Robert Jones Agnes Hunt Orthopaedic Hospital, Oswestry, UK

Introduction: Distal radius osteotomy alleviates pain and restores function following fracture malunion. Post-correction, the resultant gap must consolidate with bone for union, posing risks such as pain, reduced strength, and potential collapse during healing. Beta Tricalcium Phosphate (β-TCP) is a widely used bone substitute. For patient-specific distal radius osteotomies using KLS Martin Individual Patient Solution (IPS), β-TCP grafts can be pre-manufactured to fit the defect, acting as a scaffold for bone growth. The graft is fabricated to be granular with holes in the structure, allowing bone ingrowth.

Aim: To evaluate outcomes of patient who have IPS distal radius osteotomies, comparing β-TCP graft with autologous or no bone graft.

Methods and Materials: Eighteen patients (median age 63.5 years) underwent IPS osteotomies for symptomatic malunion. Nine received β-TCP bone substitute, and the rest had autologous (3 patients) or no grafts (6 patients). Outcomes included time to union, hand grip strength, reported pain, confidence in wrist use, Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) and Patient-Rated Wrist Evaluation (PRWE) scores, and radiological findings on radiographs and computer tomography (CT). Hand grip strength and patient scores were taken pre and 3 months post operatively.

Results: Median grip strength improvement was 5.3 kg for the β-TCP group, 6.7 kg for autologous, and 4 kg for no graft. QuickDASH scores improved by 19 with β-TCP, 20.3 with autologous, and 14.2 with no graft. PRWE score improvements were 29, 31, and 25, respectively.

At 3 months, all patients exhibited bone formation at osteotomy site. There were no reported complications. Patients with β-TCP grafts demonstrated bony ingrowth by 3 months and consolidation by 6 months. There was resorption noted in two cases at 12 months but CT-confirmed union. Patients with autologous bone graft showed similar healing time. Patients without grafts experienced slower consolidation (6–9 months) and reported reduced confidence and mild discomfort during this time.
Conclusion: In this cohort of patients, all achieved bone union with improvement in hand grip, QuickDASH and PRWE scores. Patient who had bone graft showed faster healing than those who did not have any. This is reflected by the trends in hand grip measurements, patient reported questionnaires and radiological findings. β-TCP grafts offered comparable healing to autologous grafts. However, it has the added benefit of avoiding donor site morbidity and reducing surgical time as the graft can be made to fit the defect. While this study is promising, the numbers are small and larger randomised trials that record serial outcomes over a longer period of follow up are necessary to confirm these findings.

A-0936 TREATMENT OF CARPAL TUNNEL SYNDROME USING A WRIST SPLINT: RANDOMIZED PLACEBO-CONTROLLED TRIAL

Isam Atroshi
Department of Orthopedics Hässleholm-Kristianstad and Clinical Sciences, Lund University, Lund, Sweden

Introduction: Wrist splinting is a common treatment method for patients with carpal tunnel syndrome.
Aim: To assess efficacy of wrist splinting in patients with carpal tunnel syndrome.
Material & Methods: A randomized parallel-group placebo-controlled superiority trial conducted at an orthopedic department from 2018 to 2022. The inclusion criteria were primary idiopathic carpal tunnel syndrome, age 25-65 years, no previous treatment, and no muscle atrophy or sensory deficit. Participants were randomized to a rigid wrist splint or a soft bandage (placebo) to be used during night-time and, if possible, during the day for 6 weeks. If no or only small improvement was experienced, treatment was continued for 4 weeks. Participants with persistent symptoms were offered surgery, but not before 3 months after treatment. The primary outcomes were the 6-item carpal tunnel syndrome symptom severity score change from baseline to 12 weeks (range 1 = no symptoms, to 5 = most severe) and rate of surgery on the study hand at 1 year. The secondary outcomes included patient-reported outcome measures (11-item disabilities of the arm, shoulder and hand, EQ-5D, treatment satisfaction), grip strength, and adverse events. Computer-generated randomization was used and sealed envelopes for concealment. Immediately after randomization the patients received the assigned treatment. The splints and soft bandages were equipped with sensors that recorded actual use.
Results: Of 142 participants (mean age 45 years, 63% women), 70 were randomized to the rigid-splint group and 72 to the soft-bandage group. At baseline, the mean symptom severity score was 2.83 (SD 0.83) in the rigid-splint group and 2.79 (SD 0.72) in the soft-bandage group, and at 12 weeks 2.45 (0.83) in the rigid-splint group and 2.52 (0.80) in the soft-bandage group; adjusted mean difference 0.08 (95% CI -0.15–0.31). At 1 year after treatment start, carpal tunnel release on the study hand had been performed in 40 patients (57%) in the rigid-splint group and 37 patients (51%) in the soft-bandage group; adjusted relative risk 1.10 (95% CI 0.81–1.48). Time to surgery did not differ significantly between the two groups (Log Rank test p=0.586), and no differences were observed in any other secondary outcomes.
Conclusions: A rigid wrist splint was not more effective than placebo in the treatment of primary idiopathic carpal tunnel syndrome and did not reduce the need for surgery.

A-0937 THE BRM DIGITALIS: A NOVEL SOLUTION FOR PROXIMAL INTERPHALANGEAL JOINT OSTEOARTHRITIS: FUNCTIONAL OUTCOMES AND PROPOSED CLASSIFICATION

Sergi Barrera-Ochoa[1], Melissa Bonilla-Chaperon[1], Leobardo Alvarez-Villalobos[1], Andres Alvial-San Martin[1,2]
[1]Institut de la Ma, Barcelona, Spain; [2]Hospital Clinico Herminda Martin de Chillan, Chillan, Chile

Introduction: Silicone implants for proximal interphalangeal joint (PIPJ) osteoarthritis (OA) (first described by Swanson, 1962) act as spacers through a process called "encapsulation", allowing fibrous capsules to form around the implant, thus reducing stiffness and pain, while allowing moderate mobility without requiring osseointegration. Despite their advantages, they have not been considered ideal for axial misalingment correction, which is specially demanded in radial digits (index and middle fingers). The BRM Digitalis silicone implant represents an evolution, presenting with a central hinge to control flexion movements (90° for PIPJ); and anatomical, slimmer stems that ensure a more precise adaptation inside intramedullary canals, resisting rotation forces and slippage. Even though the tendency to surgically treat this condition is on the rise, no specific classification system for PIPJ OA has been described up to this date. We consider it essential to be able to establish more accurate criteria regarding treatment indications in these patients.
Aim: The purpose of this research is to describe the results obtained in our cohort with PIPJ OA using BRM Digitalis silicone PIPJ prosthesis, as well as proposing a PIPJ osteoarthritis classification system.
Material & Methods: This is a retrospective, longitudinal study with prospective follow-up. A total of 33 patients with PIPJ OA were evaluated with a minimum postoperative follow-up period of 24 months. All surgeries were performed by the same two surgeons using the same technique (either through volar or dorsal approach) and postoperative protocol. Preoperative OA was addressed and staged according to our proposed classification (1-to-4), and patients operated on were staged >=2; functional variables were measured before surgery and in the follow-up period by the same independent hand surgeon. Angle measurements were rounded to the nearest round-number degree (non-decimal).
Results: The average follow-up period was 27.8months. Average patient age was 62.7years; 24 patients were male (72,7%) and 9 were female (27,3%). 42,3% presented a stage 3 PIPJ OA, according to our proposed classification. All patients were operated through a volar approach, except for two cases of dorsal approach (surgeon's choice). 57,6% of the digits operated on were middle-finger. Average operating time was 51,4 minutes. Average return-to-work time was 12,7 weeks (SD: 3,57). Patients had an average coronal deviation angle reduction of 5,36° (SD: 3,26), with range-of-movement improvement (Total-active-motion, Pulp-to-palm distance, extension lag) and grip force improvement throughout all cases. Regarding reinterventions, one case underwent arthrodesis at postoperative month 32 due to persistent pain, and one case underwent tenolysis at 36 months postop due to persistent metacarpophalangeal stiffness. No cases of bone erosion or implant breakage were observed
Conclusions: Currently, the BRM Digitalis silicone PIPJ implant is a promising solution in patients demanding PIPJ arthroplasty, improving functional variables while reducing traditional complications, mostly regarding implante breakage and instability. Our PIPJ OA classification is a proposal to try to unify criteria when trying to accurately indicate arthroplasty procedures in these patients. However, further studies (including longer prospective follow-up series and comparative series) need to be performed in order to continue to evaluate this option of treatment.

A-0938 RECONSTRUCTION OF SUPINATION IN SPASTIC UPPER LIMB

L Fialova[1,2], D Horackova[1], K Fajtova[2], I Borges[2]
[1]Institute for Hand and Plastic Surgery, Vysoke nad Jizerou, Czech Republic; [2]Department of Plastic Surgery, Faculty Hospital Bulovka, Prague, Czech Republic

Introduction: Pronation contracture of the forearm in spastic upper limb is caused by an imbalance between supinatory and pronatory muscles. Gschwind- Tonkin distinquish 4 groups and recommend specific procedures: 1-no surgery, 2-spastic pronator release, 3- PT transfer or FCU to ECRB/EDC transfer, 4 – release spastic pronators, PT transfer considered. Copper preformed flexor-pronator release or slide, but others – Braun causion against hypersupination deformity. Ozkan 2003 utilize BR rerouting. Another possibility is hyperselective neurectomy based on diagnostically used botox, which is recommended by Caroline Leclercq.
Methods: In spastic upper limb reconstruction we go from proximal to distal. In the elbow level we solve the elbow flexon contracture, but also start to improve passive and often active supination by fractional lengthening of the FP mass, mainly the PT. In the second phase of grip reconstruction, we again improve passive and active supination by lengthening the PQ - only ulnar fasciotomy to avoid supination contracture and simultaneous transfer of the FCU to the ECRB/EDC, after surgery we splint for 6 weeks in supination.
We performed fractional lengthening PT in 148 patients and lengthening PQ + transfer FCU to ECRB/EDC in 181 patients and only 14 rerouting PT since 2009. The improvement of active supination was better without rerouting PT -on average 50 degrees, therefore we no longer perform PT rerouting as before. There has never been a complication of overcorrection – supination contracture.
Conclusion: Supination enhancement improves hand function- facilitates bimanual activities, personal hygiene and grasping. To improve supination we only release the pronators and use concomitant procedures for flexion contracture. Recently we have started to perform HSN too.

A-0939 REPAIR OF A FLEXOR TENDON

Amir Oron
Hand and Microsurgery, Ramat HaSharon, Israel

TendoCoil is a new device which acts as an adjunct to the surgery and affords better rehabilitation in flexor tendon repair. The device has been used successfully in a series of six clinical cases wherein flexor tendon injury in zones 1 and 2 was treated by surgical intervention. We present our preliminary results and the device evolution by use of three-dimensional printing as an adjunct to device design and build as well as how the use of the device by the rehabilitation team, surgeon and patient may prove it to be a gamechanger in tendon surgery altogether.
The TendoCoil device is placed at the distal end of the digit following suture of the severed tendon with use of a modification to the Kessler sliding grasping suture (Professor Kessler was the former head of our department – and invented the widely used Kessler suture). We then tie the protruding suture ends into the dedicated area in the device, maintaining suture tension. Moreover, the device allows tensioning of the suture repair site several days and even weeks should dehiscence or gapping be suspected. Better yet, in its current embodiment it relays actively the tension experienced by the suture material during all phases of rehabilitation.
Our initial series consists of six repairs with no failures and a residual limitation in range of motion in merely two cases. Ultrasound assessment of the tendon suture site revealed healing and ultimate tendon remodeling similar to normal

tendon with no residual bulkiness or suture material following device and suture removal.
We believe the initial results presented here with the use of the TendoCoil device and technique are promising and lay the path to a revolution in flexor tendon repair and rehabilitation. This device incorporates the use of a dedicated Cellular phone application which incorporates input from the patient, rehabilitation team and surgeon.

A-0940 MANAGEMENT AND AMBULATION OF PATIENTS WITH OPEN HAND FRACTURES: IS TIME CRITICAL?

L Conway, G Airey, R Sultan, S Pocnetz, D Bell
Mersey & West Lancashire Teaching Hospitals NHS Trust

Background: There is a relative paucity of evidence and guidance regarding treatment open hand fractures compared to long bone open fractures.
We aimed to the characteristics of our cohort of open hand fracture patients and particularly their outcomes based on treatment with antibiotics and time to theatre. A proportion of these patients were ambulated with oral antibiotics prior to their admission at our unit or even before their operation following initial presentation to an external referring unit during the initial COVID-19 outbreak. We took the opportunity to see whether this is safe practice and to examine any factors associated with infection in this cohort.
Method: Data on demographics, time to first operation, intravenous (IV) antibiotic and whether the patient was ambulated (not admitted immediately to our unit for IV antibiotics pre-operatively) were gathered. Linear and logistic regression were used to assess the relationship between these parameters and infection, reported as odds ratio (OR)
Results: 204 open proximal phalanx, middle phalanx and metacarpal fractures were included from 2020-2023. 169 occurred in males (83%). 48 fractures were ambulated pre-op. 14 of these were not given IV antibiotics at any stage. 11 cases of superficial infection (5.5%) and 2 cases of osteomyelitis (1%) were observed
Mean time to first IV antibiotics was 14.9 hours (SD25.1) and mean time to first operation was 45.8 hours (SD32.3). 4 fractures were treated with IV antibiotics within 1 hour of injury (2.1%) and 158 within 24 hours (84%). 51 fractures were operated on within 24 hours (25%) and 180 within 72 hours (88.2%).
No significant relationship was observed between time to operation and infection. A significant relationship was demonstrated between >48hours until IV antibiotics and superficial infection (OR 1.48 p=0.047). Ambulation was associated with a >72h wait for first operation (OR 1.62 p=0.00) but was not significantly associated with infection (OR 1.29 p=0.73). Being given oral antibiotics only was not significantly associated with infection (OR 2.6 p=0.30).
Conclusion: Infection in open hand fractures appears to be rare. However, based on these initial findings, there is evidence to support giving IV antibiotics within 48 hours of injury in open hand fracture patients. Ambulation appears to be a safe way to manage these injuries however larger scale studies would be beneficial along with stratification of open injuries according to severity.

A-0941 DAY HOSPITAL MANAGEMENT OF PEDIATRIC HAND SURGERY: CLINICAL EXPERIENCE AND OPERATIONAL ADVANTAGES

Filippo Zanotti, Massimo Corain, Sara Namer, Roberta Sartore
Hand surgery and Microsurgery Unit, Verona University Hospital, Italy

Pediatric hand surgery is a specialized field that necessitates a highly personalized and multidisciplinary approach. In recent years, the day hospital (DH) model has emerged as an effective strategy for managing congenital and acquired

hand conditions in pediatric patients. This study aims to evaluate the outcomes of a standardized protocol for pediatric hand surgeries performed in a DH setting, focusing on its efficacy, safety, and family acceptance.
Methods: A retrospective analysis was conducted on data from 584 pediatric patients (aged 0–16 years) who underwent hand surgery between 2019 and 2024. Sixty-two percent of the patients were under 3 years of age. The procedures included syndactyly correction, treatment preaxial anomalies, trigger finger release, removal of benign vascular and non-vascular masses, hand trauma management, and repair of minor congenital anomalies. We excluded patients with major general problem or syndromic diseases.The protocol involved a multidisciplinary preoperative evaluation few days before surgery, general anesthesia combined with regional nerve blocks for postoperative pain control, postoperative monitoring, and same-day discharge.
Results: Ninety-eight percent of patients were discharged on the same day as planned without significant postoperative complications. Only 2% required extended hospital stays for pain management or postoperative observation. Parental satisfaction was high (97%), primarily due to reduced hospital-related stress, good pain relief with fixed-dose regimens and the rapid return to family routines. The DH model also demonstrated cost-effectiveness, reducing hospital expenses by 30% compared to traditional inpatient care.
Pain management relied on fixed-dose paracetamol regimens.
Conclusions: Day hospital management of pediatric hand surgery has proven to be a safe and effective approach, with high satisfaction levels among patients and their families. This model optimizes healthcare resource utilization and promotes early recovery, making it an ideal solution for selected pediatric conditions. Our experience confirms long-term benefits and suggests exploring the broader applicability of this protocol to other conditions.

A-0942 ANCHORAGE OF CUSTOM-MADE LUNATE PROSTHESIS IN KIENBOCK DISEASE. HAVE WE THE SOLUTION?

Massimo Corain
Hand surgery and Microsurgery Unit, Verona University Hospital, Italy

Purpose: Kienbock's disease is an invalidant pathology characterized by osteomalacia for progressive bone necrosis of lunate. According to Lichtman classification, in Lichtman stage III (A,B,C) the prosthetic replacement is a surgical option.
Different prosthetic types and various materials were proposed in the past, today we can consider titanium custom made prosthesis. ur objective is to evaluate the option of a titanium custom made prosthesis with 3D printing in order to delay the surgical option of PRC in youngest patients. This study present two cases treated with lunate custom made prosthesis created with 3D printing technology elaborated on the controlateral healthy carpal bones with mirroring tc technique, with 3 years of follow-up. Different design and different anchorage system to the proximal carpal raw have been considered.
Introduction: Lunate replacement is a surgical option in case of Kienbock's disease with a too much damaged lunate to be treated with rescue procedures avoiding or postponing the proximal raw carpectomy. Standard prosthesis were proposed with contrasting results. Today the tendency is represented by use of artificial implant, specifically 3D printed prosthesis based on controlateral healthy lunate. Tha main indication to lunate replacement with prosthesis is Kienobock's disease stage Lichtman IIIa and IIIc. In the last decade we used a standard pyrocarbon implant with controversial results that helps us to understand and study the cinematic and possible anchorage at the proximal carpal raw.
Furthermore we have to consider the individual anatomical variants of lunate bone as described from the studies by Viegas in 1990 4 and then by Antuna-Zapico 5 . This study has the purpose to show tho clinical cases of Kienbock's disease treated with 3D technique custom made titanium prosthetics, their technical tips during the surgery replacement and possible contraindications.

A-0943 POST-TRAUMATIC FOREARM CORRECTIVE OSTEOTOMIES IN GROWING CHILDREN: OUTCOMES AND CONSIDERATIONS

Massimo Corain, Roberta Sartore, Lorenzo Marcucci, Giulio Bevilacqua, Filippo Zanotti
Hand surgery and Microsurgery Unit, Verona University Hospital, Italy

Corrective osteotomies of the forearm are often required in growing children to address deformities resulting from malunited fractures. These deformities can lead to functional limitations, aesthetic concerns, and long-term joint issues. This study evaluates the clinical outcomes of post-traumatic forearm corrective osteotomies performed during the growth age, focusing on timing, possible complications and the impact on bone growth.
Methods: We consider a case series of forearm post-traumatic deformity treated with traditional experience-based approach and more recently with Patient Specific Implant and 3D planning. Prono-supination impairment and dysmetria are often reasons requiring a correction. Considerations about timing, approaches and functional results are reported.

A-0944 SYNDACTYLY CORRECTION: A MODIFIED APPROACH WITHOUT SKIN GRAFT

Mattia Giardini, Roberta Sartore, Federica Ceretta, Massimo Corain
Hand Surgery and Microsurgery Unit, Verona University Hospital, Italy

Introduction: Syndactyly is a congenital anomaly characterised by the union of two adjacent fingers resulting from abnormalities in the apoptotic phase of limb development. Over the years, numerous authors have proposed various types of local flaps to treat the various forms of syndactyly.
Aim: In this study, the results of syndactyly surgical corrections performed with or without ipsilateral wrist skin graft are analysed, with the aim of assessing the actual need for a skin graft and correlating this need to the age of the operated patient, the different skin phenotypes and the severity of the syndactyly.
Material & Methods: From June 2017 to June 2023, 45 children, a total of 60 hands, aged 8 months to 7 years, average age at surgery of approximately 2 years, were operated in our OU. Until the end of 2020, the surgical technique always involved the use of full-thickness skin graft taken from the volar-ulnar region of the ipsilateral wrist, for a total of 30 hands operated with graft (group A). From 2020 to the end of 2023, it was decided to no longer perform any skin grafts and to adjust grafts to individual needs and/or to have residual dehiscences healed by second intention, for a total of 42 hands (group B). All patients underwent the same surgical incisions by the Senior Surgeons. All patients continuously maintained the packed dressing for a total of 3 weeks, at the end of which an outpatient evaluation was performed. We then assessed the clinical evolution of the scars, both cosmetic and functional, using the parameters of the Vancouver scale weighted with subjective parental ratings (Patient and observer scar assessment scale) and any complications and/or recurrences, correlating with the patient's age at the time of surgery. As for group A with a minimum follow-up of 4 years and an average of 5 years. As for group B with a minimum follow-up of 1 year and a mean of 2.5 years. The results of the two different surgical techniques were then compared.
Results: All treated patients healed within 3 weeks, in group A 3 revision surgeries were necessary in the short term, in group B 2 scars had to be revised due to the appearance of hypergranuloplastic fundus.
The distant result of syndactyly corrections without grafts performed in our OU does not seem to entail either a delay in healing time or the occurrence of early secondary complications requiring a second surgery, thus obtaining elastic commissures and non-retracting scars already from the primary treatment
Conclusions: The evaluation of our results, in order to avoid scar retraction and consequent deformities, underlines the

need for a correct planning and execution of the first surgery, mainly assessing the age of the first surgery, the type of incision and the skin phenotype. According to the results of the present study, the use of skin autografts should be reserved only for the few cases of excessive local dehiscence, or scar inextensibility of the skin.

A-0945 HARDWARE REMOVAL AFTER ULNA SHORTENING OSTEOTOMY IN RELATION TO PLATE LOCATION AND PLATE TYPE: ISALA HAND-WRIST CENTRE COHORT STUDY

Britte L. Buisman, Bernard O. Verwer, Tjeerd R. de Jong, Willem G. van Rijt
Department of Plastic, Reconstructive and Hand Surgery, Isala Hand-Wrist Centre Zwolle, the Netherlands

Introduction: Ulna shortening osteotomies (USO) are commonly done to treat ulnar-sided wrist disorders such as ulnar impaction syndrome. Complaints of plate irritation can occur and then lead to hardware removal. Previous retrospective studies have reported contradictory results of the incidence of hardware removal in relation to palmar and dorsal plate location.
Aim: The aim of this study was to analyse the incidence of hardware removal after USO due to patient complaints of plate irritation in relation to plate location and type, and to determine the proportion of patients whose complaints resolved after hardware removal.
Methods: In this retrospective study, we assessed all patients who were treated with an USO at the Isala Hand-Wrist Centre between January 2016 and December 2023. Electronic patient records and radiographs were reviewed. Patients were contacted by telephone to assess the effect of hardware removal.
Results: We included 135 USO procedures on 131 patients with a median follow-up of 47 months (IQR 48). Plate irritation was reported by 31 patients (23%), with 25% in the dorsal group (17/69) and 21% in the palmar group (14/66, (p=0.637). Hardware was removed due to patient complaints in 25 patients (19%) at a median of 56 weeks after USO (IQR 27, range 22-111 weeks), with 20% (14/69) in the dorsal group and 17% (11/66) in the palmar group (p=0.589). There was no difference in hardware removal between TriMed (15/81) or Medartis (8/44) plates (p=0.963). Nine patients (7%) required surgical revision of a nonunion. Following hardware removal in 25 patients, one patient sustained a re-fracture. Symptoms of plate irritation resolved with hardware removal in 18 out of 25 patients.
Conclusions: This study demonstrates that USO was associated with a 19% incidence of hardware removal due to patient complaints of plate irritation. There was no difference between dorsal or palmar plate positioning on the incidence of hardware removal. Plate type was also not associated with increased incidence of hardware removal. Therefore, choice of plate location and type can be based on patient characteristics and surgeon preference.

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Italy

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A-1253 AN OVERVIEW OF COMMON PAEDIATRIC HAND INJURIES, CONSERVATIVE MANAGEMENT AND INDICATIONS FOR SURGERY
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A-1254 OPERATIVE TREATMENT OF PAEDIATRIC FINGER FRACTURES
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A-1255 PAEDIATRIC FLEXOR TENDON INJURIES AND MISTAKEN CASES FOR TRAUMA SUCH AS TRIGGER THUMB ETC
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UK

A-1259 STEROID VERSUS PLACEBO INJECTIONS AND WRIST SPLINTS IN PATIENTS WITH CARPAL TUNNEL SYNDROME: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS (JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2024;49(10):1209-1217.)
Adindu E, Ramtin S, Azarpey A, Ring D, Teunis T.
USA

A-1260 PREVALENCE OF TRANSTHYRETIN AMYLOIDOSIS IN PATIENTS UNDERGOING CARPAL TUNNEL SURGERY: A PROSPECTIVE COHORT STUDY AND RISK FACTOR ANALYSIS (JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2024;49(8):1002-1007.)
Brunet J, Rabarin F, Maugendre E, Cesari B, Petit A, Bigorre N.
France

A-1261 FUNCTIONAL OUTCOMES ARE RESTORED A DECADE AFTER A DISTAL RADIUS FRACTURE: A PROSPECTIVE LONG-TERM FOLLOW-UP STUDY. JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2024;49(3):322-328.)
Schmidt V, Gordon M, Petterson A, et al.
Sweden

A-1262 LUNOCAPITATE VERSUS FOUR-CORNER FUSION IN SCAPHOLUNATE OR SCAPHOID NONUNION ADVANCED COLLAPSE: A RANDOMIZED CONTROLLED TRIAL. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2024;49(5):601-607
Schriever T, Swärd E, Wilcke M.
Sweden

A-1263 DOES LIDOCAINE REDUCE PAIN INTENSITY DURING CORTICOSTEROID INJECTION? A DOUBLE-BLIND RANDOMIZED CONTROLLED EQUIVALENCE TRIAL. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2024;49(10):1202-1208
Teunis T, Sayegh GE, Fatehi A, Ring D, Vagner G, Reichel L.
USA

A-1264 SUPERCHARGING OF THE ULNAR NERVE: CLINICAL AND NEUROPHYSIOLOGICAL ASSESSMENT AT 2 YEARS FOR NINE PROXIMAL INJURIES. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2024;49(9):1139-1146
Thorkildsen RD, Kleggetveit IP, Thu F, Madsen LM, Bolstad BJ, Røkkum M.
Norway

A-1265 RESPONSIVENESS AND VALIDITY OF THE NORMAL HAND SCORE IN PATIENTS UNDERGOING CARPAL TUNNEL DECOMPRESSION. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2024;49(8):965-969
Stirling PHC, Yapp LZ, McEachan JE.
UK

A-1266 DUAL MOBILITY PROSTHESIS FOR TRAPEZIOMETACARPAL OSTEOARTHRITIS: RESULTS FROM A PROSPECTIVE STUDY OF 55 PROSTHESES. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2023;48(6):566-574
Florian Falkner, Arman M Tümkaya, Benjamin Thomas, Benjamin Panzram, Berthold Bickert, Leila Harhaus
Germany

A-1267 TOTAL JOINT ARTHROPLASTY VERSUS TRAPEZIECTOMY IN THE TREATMENT OF TRAPEZIOMETACARPAL JOINT ARTHRITIS: A RANDOMIZED CONTROLLED TRIAL. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2023;48(9):884-894
Tjeerd R de Jong, Elske EDJ Bonhof-Jansen, Sander M Brink, Ramon P de Wildt, Jeroen H van Uchelen, Paul MN Werker
The Netherlands

A-1268 THE RELIABILITY OF CLINICAL ASSESSMENT OF DISTAL RADIOULNAR JOINT INSTABILITY. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2022;47(4):375-378. DOI:10.1177/17531934211054282
Grey EB Giddins, Greg T Pickering, Nicola F Fine, Thomas D Knapper
UK

A-1269 NONRESPONDER BIAS IN HAND SURGERY: ANALYSIS OF 1945 CASES LOST TO FOLLOW-UP OVER A 6-YEAR PERIOD. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2022;47(2):197-205. DOI:10.1177/17531934211045627
Paul HC Stirling, Paul J Jenkins, Nathan Ng, Nicholas D Clement, Andrew D Duckworth, Jane E McEachan
UK

A-1270 EVALUATION OF A CONVOLUTIONAL NEURAL NETWORK TO IDENTIFY SCAPHOID FRACTURES ON RADIOGRAPHS. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2023;48(5):445-450. DOI:10.1177/17531934221127092
Tao Li, Yaobin Yin, Yi Z, Zhe Guo, Zhenlin Guo, Shanlin Chen
China

A-1271 LOW COMPLICATION RATE AND HIGH IMPLANT SURVIVAL AT 2 YEARS AFTER A TRAPEZIOMETACARPAL JOINT ARTHROPLASTY. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2023;48(9):877-883. DOI:10.1177/17531934231179581
Daniel B Herren, Miriam Marks, Sara Neumeister, Stephan Schindele
Switzerland

A-1272 SHORT-TERM RECOVERY AFTER IMPLANT VERSUS RESECTION ARTHROPLASTY IN TRAPEZIOMETACARPAL JOINT OSTEOARTHRITIS. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2023;48(10):1048-1055. DOI:10.1177/17531934231188407
Daniel B Herren, Miriam Marks, Sara Neumeister, Stephan Schindele
Switzerland

A-1273 CLINICAL AND RADIOLOGICAL RESULTS OF DISTAL RADIOULNAR JOINT ARTHROPLASTY WITH A PROSTHESIS. - JOURNAL OF HAND SURGERY (EUROPEAN VOLUME). 2022;47(4):379-386. DOI:10.1177/17531934211063608
Delphine Lambrecht, Wim Vanhove, Nadine Hollevoet N.
Belgium

A-1274 TBD
Janou W.J.M. Bardoel
The Netherlands

A-1275 TBD
Karin Boer-Vreeke
The Netherlands

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Brigitte Van der Heijden, Jorma Ryhänen, J Henk Coert
The Netherlands, Finland, The Netherlands

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Gürsel Leblebicioglu, Shai Luria
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Duncan McGrouther
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A-1279 ROBOTIC HAND SURGERY: OVERVIEW, IMPLICATIONS AND CURRENT RECOMMENDATIONS
Bo Liu
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A-1283 OVERVIEW OF THE USE OF AI IN HAND SURGERY
Turkka Anttila
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Oyama Shintaro
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Singapore

A-1286 HARNESSING THE UNINJURED BRAIN FOR TREATMENT OF THE STROKE OR BRAIN INJURED PATIENT – THE CONTRALATERAL C7 TRANSFER (VIDEO)
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Camillo Fulchignoni
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Jonathan Hobby
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A-1292 VIDEO OF 2025 FELLOWS

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Brigitte van der Heijden

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Jorma Ryhänen

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Radek Kebrle
Czech Republic

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Anne Vochteloo
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Gustavo Mantovani
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Andreas Schweizer
Switzerland

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Frederik Verstreken
Belgium

A-1312 KEYNOTE PRESENTATION:"FUTURE OF HANDSURGERY"
Wee Leon Lam
Singapore

A-1313 SHARK TANK SESSION OPENING, INTRODUCTION OF LAST YEAR'S WINNERS
Leila Harhaus, Judit Hethéssy, Johannes Winker
Germany, Hungary, Germany

A-1314 3D PRINTED SUTURE PADS AND AUGMENTED REALITY TO IMPROVE MICROSURGICAL TRAINING - 2022 WINNER
Olimpia Mani
Italy

A-1315 AN APP USING AI FOR THE POST-SURGERY MANAGEMENT OF THE WRIST-HAND-FINGER INJURIES AND PATHOLOGIES TO PERFORM IN-HOME THERAPEUTIC EXERCISE - 2023 WINNER
Alejandro Suero Pinea
Spain

A-1316 APP FOR HAND ASSESSMENT - 2024 WINNER
Andrea Moser
Austria

A-1318 ANNOUNCE TO START THE COMPETITION, INTRODUCTION OF THE SHARKS
Leila Harhaus, Judit Hethéssy
Germany, Hungary

A-1319 METAL DETECTOR FOR CLINICAL USE
Nikke Osterback
Finland

A-1320 BURNING HAND
Cosima Prahm
Germany

A-1321 E-LEARNING APPLICATION FOR SURGICAL TRAINING (VIDEO)
Macarena Vizcay
Italy

A-1322 ABSORBABLE INTRAMEDULLARY SCREW FIXATION OF METACARPAL FRACTURE
Dániel Koczka
Hungary

A-1323 THERAPEUTIC JEWELRY
Marta Jokiel
Poland

A-1324 3D REALITY
Xavier Gueffier
France

A-1325 INTRODUCTION OF FESSH RESEARCH GRANTS
Leila Harhaus
Germany

A-1326 BONE MARROW ADIPOCYTES: UNRECOGNIZED REGULATORS OF PATHOLOGICAL BONE REMODELLING IN CARPOMETACARPAL OSTEOARTHRITIS OF THE THUMB
Mauro Maniglio
Switzerland

A-1328 TRANSLATION AND VALIDATION OF MICHIGAN QUESTIONNAIRE - 2024 PROMS GRANT WINNER
Zoltán Sándor
Hungary

A-1329 POLISH ADAPTATION OF URAM AND SDSS QUESTIONNAIRES IN DUPUYTREN'S DISEASE - 2024 PROMS GRANT WINNER
Joanna Kot and Michal Gorecki
Poland

A-1330 A RANDOMIZED CONTROLLED TRIAL COMPARING NO REDUCTION TO CLOSED REDUCTION FOR DISTAL RADIUS FRACTURES IN PATIENTS OVER 65-YEAR-OLD (DISCLOSE TRIAL): A STUDY PROTOCOL - 2025 CLINICAL GRANT WINNER
Antti Launonen
Finland

A-1331 PROMS 2025 GRANT WINNERS INTRODUCTIONS
Argyro Pipinia, Natan Silver, Martin Aman
Greece, Israel, Germany

A-1332 ANNOUNCEMENT OF THE 2025 SHARK TANK WINNERS
Leila Harhaus, Johannes Winker, Christian Leibinger
Germany

A-1333 CHALLENGING THE MARGINS: XPERT SOLUTIONS FOR MARGINAL FRACTURES REDUCTION
Pier Giuseppe Zampetti
Italy

A-1334 A RETROSPECTIVE REVIEW AND CLINICAL OUTCOMES USING PATIENT SPECIFIC INSTRUMENTATION AFTER 8-YEAR OF EXPERIENCE
André Gay
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A-1335 IMPROVEMENTS IN SURGICAL PLANNING OF WRIST MALUNIONS, A NEW 3D REFERENTIAL
Thibault Poujade
France

A-1336 LIVE MOCK VIVA
Catherine Bossut, Nico Schwalfenberg, Aleksandra Parsons
Ireland, Germany, UK

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Brigitte van der Heijden
The Netherlands

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A-1345 SPAIN BID FOR FESSH 2029
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A-1392 WRIST EXAMINATION
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A-1394 WRIST EXAMINATION
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CONTACT

FESSH Management Office
Email: office@fessh.com
Website: www.fessh.com

ASSZISZTENCIA Congress Bureau
Email: registration@fessh2025.com
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