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SGH-/SGHR-KONGRESS CONGRÈS SSCM/SSRM

Congress Kursaal Interlaken
23.-24.11.2023

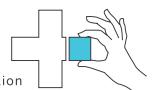
Patients first



Abstracts



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Freie Mitteilungen SGH

Communications libres SSCM

Freie Mitteilungen / Communications libres I: Tendons and Nerves

FM1

Reoperations in spasticity-reducing surgery of the upper extremity

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Introduction. Spasticity occurs with upper motor neuron lesion in cerebral palsy, acquired brain injury or spinal cord injury. Thus, spasticity affects a heterogeneous group of individuals, ranging from slight dysfunction to severe disability. Spasticity-reducing surgery has been shown promising results in short term follow up regarding function and patient satisfaction. Nevertheless, only little is known about long term outcome especially concerning reoperation in recurring spasticity.

Methods. This is a retrospective consecutive case series of reoperations in spasticity-reducing surgery in the upper extremity in our center since 2014. We define reoperation as repeat surgery because of reappearance of spasticity at the same level (shoulder, elbow, forearm, wrist, finger, thumb). Demographic data, causative pathology for spasticity and time period between prior surgery and reoperation are analyzed. Patients are allocated to a non-, low- and high-functional status as proposed by Ramström (2021).

Results. From 2014 until 2023 we performed 118 spasticity-reducing surgeries in the upper extremity. We found 20 reoperations, 15 of which were multi-level surgeries. Recurrence of finger flexion spasticity appeared most often (11 cases), 7 of them needed a correction of intrinsic tightness. Further we recorded recurrence of wrist flexion deformity in 9 cases, thumb spasticity in 7 cases and forearm rotation spasticity in 3 cases. Regardless their pathology, we classified 5 patients as high-, 9 patients as low- and 6 patients as non-functional. Surgical procedures in reoperations included tendon re-lengthening and release, tendon transfer, hyperselective/selective neurectomy and arthrodesis.

Conclusion. Spasticity is a dynamic, time-evolving process. Patients should therefore be informed that spasticity may develop again after successful surgery in the long run. This has particularly been

shown for finger flexion spasticity where we emphasize the importance of recognizing intrinsic tightness before and during surgery by clinical testing.

FM2

Extensor carpi ulnaris transfer – a valuable option to correct spastic wrist flexion deformity

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(¹Nottwil)

Introduction. Upper limb spasticity-induced deformities inhibit activities of daily living, resulting in impaired self-care and reducing quality of life. The hyper-flexed and ulnar-deviated wrist is a key element of the dysfunction, compromising grip function and causing pain. In patients with longstanding wrist flexion deformity, a palmar subluxation of the Extensor carpi ulnaris (ECU) tendon can be observed. The ECU tendon has a very small wrist extension moment arm but a relatively large ulnar deviation moment arm. Therefore, even a limited palmar subluxation transforms the ECU into a wrist flexor aggravating the flexion-ulnar deviation deformity. Based on this observation, we implemented the transfer of the ECU to Extensor carpi radialis brevis (ECRB) tendon.

Methods and Results. From 2018 to 2022, we performed ECU to ECRB transfer in 47 hands with a mean age of 29 years (range 13 to 64). The preoperative assessments included measurement of wrist flexion deformity and ulnar deviation, Ashworth scale, classification of hand function and survey of the Arm Activity Measure (ARMA) score. These assessments were repeated 6, 12 and 24 (18/40 patients) months postoperative. 42 patients underwent concomitant procedures as tendon lengthening, muscle release or hyperselective neurectomy to correct the entire deformity. In 9 patients with ECU to ECRB transfer, an additional proximal row carpectomy was needed to correct wrist position. The mean wrist flexion deformity preoperative was 90° (range 20° to 130°). At 12 months follow up, a mean resting position of the wrist of 0° was achieved (range 20° of flexion to 30° of extension) and ulnar deviation was corrected (<30°). The improved hand posture remained at 24 months postop control. The assessment of the ARMA score section A showed a decrease from 15 preoperative (maximum disability 32) to 4 at 12 months postop control.

Conclusions. ECU to ECRB transfer rebalances the wrist while maintaining mobility. This procedure is beneficial and feasible in the majority of wrist flexion deformities, including also severe cases with 120° of flexion. Our case series show that by combination of tendon lengthening of spastic wrist

and finger flexors with the ECU to ECRB transfer, a more favourable wrist position can be achieved and maintained. The improved wrist position facilitates personal care in the non-functional hands and allows for better grasp - release control in functional hands.

FM3

Nerve transfers in spastic hemiplegia: our clinical experience with the first eleven patients

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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. We performed cognitive nerve transfers in stroke patients and prospectively investigated their effects on clinical and functional level.

Method. 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 eleven hemiplegic patients. We additionally reinnervated the spastic pronator teres muscle with a branch to the pectoralis major muscle using a vascularised 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 6, 12 months and 24 months after surgery.

Results. So far eleven patients have been operated, seven patients have completed the 12-month and four the 24-month follow-up. All patients presented with an improvement in all clinical and functional scores with statistical significance ($p<0.05$) for DASH and modified Ashworth scale.

Conclusion. Cognitive muscle reinnervation through selective nerve transfers seems to reduce spasticity while providing volitional control and may offer the possibility for permanent biological improvement of hand function. in stroke patients. A longer follow-up and higher number of patients is needed.

FM4

A cohort study on neuropathic pain of the radial nerve—Factors influencing surgical outcome

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Background. Due to its partially superficial course, the superficial branch of the radial nerve is vulnerable to injury by trauma or surgery potentially leading to neuropathic pain. Different surgical techniques to treat neuroma have been described but so far no one has proven to be superior to the others. The aim of this study was therefore to identify factors influencing the outcome of revision surgery for neuropathic pain of the superficial branch of the radial nerve in our department.

Methods. We reached out to all patients who had undergone revision surgery for neuroma of the superficial branch of the radial nerve between 2010 to 2020 18 patients could be recruited for a follow-up visit. A medical chart review was performed to collect patient, pain-, and treatment-specific factors. Current DASH score, MHQ score, and Pain Detect score as well as a clinical examination were performed. Outcomes were registered.

Results. Post-revision surgery, only 2 (11%) patients were pain-free. Pain did however improve in 16 (88.9%) of patients. Different types of surgery were performed but no superiority of a single technique could be demonstrated. Only 7 (38.9%) of patients returned to their previous field of work. Patients with a postop VAS score >2 were more likely to be smokers and those patients with lesions of the main nerve trunk (as compared to end branch lesions) were more likely to have a persisting VAS score >2 .

Conclusion. Patients with injury to the superficial branch of the radial nerve should be informed that while they might not be fully pain-free after revision surgery pain will most likely improve but there is a high risk they might not be able to return to their previous field of work. Additionally, Patients with injury to the superficial branch of the radial nerve should be coached toward smoking cessation.

FM5

Targeted muscle reinnervation into lumbrical muscles for treating symptomatic digital stump neuroma

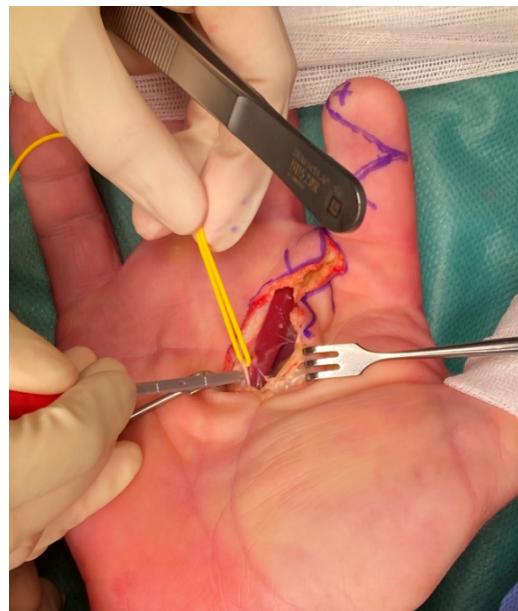
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^(¹Zürich)

Objective. To present the surgical technique and preliminary results of treatment of painful digital end-neuromas with targeted muscle reinnervation into lumbrical muscles

Methods. Case presentation-Surgical technique: We performed neuroma excision and targeted muscle reinnervation into the second lumbrical muscle. The motor entry point is found approximately 18mm proximal to the A1 pulley (proximal end) of the middle finger. First, we began by dissecting the nerve to the lumbrical muscle, so that we would not exceed the 20-min tourniquet time for nerve stimulation. The ulnarpalmar digital nerve of the index was dissected to the level of the dorsal nerve branch at the metacarpophalangeal joint. Intraneural neurolysis was then performed from distal to proximal over another centimeter to preserve the dorsal branch and reach the target. The recipient nerve was transected about 8mm proximal to the motor entry point. Tension-free coaptation without size discrepancy was possible. The coaptation site was sealed with fibrin glue, and the nerve was blocked with an intraneuronal injection of ropivacaïn 1%.

Results. At three-month follow-up the patient perceives no pain or slight pain (VAS 1-2) with light touch on the ulnar stump side. So far, we have treated three patients with painful digital stump neuromas with targeted muscle reinnervation into lumbrical muscles. Patient-reported outcomes show significant improvement in quality of life, sleep and mental health.

Conclusion. Targeted muscle reinnervation into expendable hand muscles appears to be a new therapeutic option with promising results. The anatomy is constant, as shown by several previous anatomical studies.



Intraoperative image of the motor branch to the second lumbrical muscle

FM6

Relocation nerve grafting for invalidating neuropathic pain – Expanding the nerve surgeon's toolbox

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Neuropathic pain after peripheral nerve injury is a debilitating and socio-economically relevant complication. Peripheral nerve surgeons have developed different treatment strategies without one being accepted as gold standard.

We report a case of a 32-years-old patient with severe neuropathic pain due to a lesion of the median nerve of the right dominant hand following a milling injury 5 years ago. The injury was treated with N1-3 reconstruction using Avance® allografts. Within one year the patient developed severe allodynia in the palm with a Tinel sign. Nerve conduction studies and ultrasound revealed intact nerves to all digits with neuroma formation. Three years after the initial reconstruction, revision surgery with N1-N3 neuroma excision and autologous medial antebrachial cutaneous nerve grafting of N1/N2 as well as end-to-side neurorrhaphy of N3 to N4 was performed. Despite revision surgery and ongoing intense occupational therapy as well as multimodal pain medication, the patient was unable to move and tolerate touch.

Two years after the revision surgery, we offered the patient a “last resort” procedure with relocation nerve grafting. For that purpose, the median nerve was re-decompressed and the affected digital nerves were intraneurally dissected out of the palm using

microscopical magnification with preservation of the motor branch to the thenar. Using a 70mm Avance® allograft, the nerves were buried in the forearm between the superficial and deep flexor muscle bellies. Special attention was given to prevent a mechanical conflict of the buried allograft and the gliding flexor tendons. Perioperative pain treatment was achieved with a supraclavicular pain catheter over 5 days.

Six weeks postoperatively the patient reported significant pain relief with VAS reduction from 10 to 2 during movement and 3 to 0 at rest as well as thumb opposition from full immobility due to pain to Kapandji 7. After almost 5 years of debilitating pain he is now using the hand again with a grip strength of 8kg (preoperatively, 0 kg). The ongoing follow-up is pending.

In conclusion, neurotomy with nerve stump relocation into muscle, vein or bone is described in the literature with inconsistent long-term results. Relocation nerve grafting using long allografts is a promising and powerful tool that might become a gamechanger in the treatment of invalidating neuropathic pain.

FM7 **New suture materials in tendon transfer surgeries. A biomechanical comparative analysis**

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Background. Commonly used high-strength suture material for tendon transfer surgeries is designed to withstand high tensile forces and secure the repaired structures in place. However, slippage of the knot is inevitable when these sutures are heavily loaded leading to laxity and gap formation between the repaired structures. On the other hand, early mobilization after tendon transfer surgery is crucial to avoid commonly observed postoperative soft tissue adhesions. Recently, a new suture was introduced (Dynacord) with a salt-infused silicone core which is designed to minimize laxity and preserve consistent tissue approximation.

Aims. To compare the biomechanical competence of Dynacord against a conventional high strength suture (Fiberwire) in a human cadaveric tendon transfer model under an early rehabilitation protocol.

Methods. Tendon transfers (FDS IV to FPL) were performed in 8 pairs human cadaveric forearms

using either Dynacord (DC) or Fiberwire (FW) in a paired study design. Markings were made approximately 1cm proximal and 1cm distal to the level of the interweaving zone of the transfer. All specimens underwent repetitive thumb flexion against resistance in nine intermittent series of 300 cycles each, simulating the postoperative rehabilitation protocol. After each series the distance of the proximal marker to the interweaving zone (proximal), the length of the interweaving zone (intermediate) and the distance of the distal marker to the interweaving zone (distal) were measured.

Results. Pooled data over all nine series, normalized to the immediate postoperative status, demonstrated significantly higher zone lengthening for FW compared to DC ($p\leq 0.038$) proximally and distally. However, at the intermediate zone, DC was associated with significant ($p<0.001$) length shortening compared to FW, the latter remaining without length changes. Proximally, whereas for FW zone lengthening significantly increased over the cycles ($p=0.009$) it remained neutral for DC ($p=0.132$). Distally, both sutures remained without significant length changes over the cycles ($p\geq 0.105$).

Conclusion. Biomechanically, DC preserved or even increased tissue approximation, and can thus be considered as valid alternative suture material to a conventional high-strength suture, the latter leading to a significant tissue laxity under cyclic loading. Therefore, DC might allow for a more aggressive early postoperative rehabilitation program to avoid soft tissue adhesion and thus reoperations.

FM8 **Surgical treatment of unstable ECU tendinopathy: Operative technique and sonographic outcome**

Silvan Pasquinelli¹, Dietmar Bignion¹, Esther Vögelin¹ (¹Bern)

Introduction. Unstable ECU tendinopathy results from dysfunction of the 6th extensor tendon compartment and leads to subluxation/dislocation of the ECU tendon. If symptomatic, surgical ECU tendon stabilization may be performed. Various surgical techniques have been described. The assessment of postoperative stability by MRI however, is only mentioned in one publication demonstrating persistent subluxation in almost 50% of the patients despite good clinical results.

Method. From 2014 -2022, 34 patients were operated using our technique. The ECU tendon is stabilized with a radially based extensor retinaculum flap. The ECU tendon undersurface and subsheath are debrided - if necessary. The lower surface of the retinaculum strip is anchored to either the subsheath or the forearm fascia on the ulnar side. On the radial side, the flap is fixed to itself with a sling around the ECU tendon. This provides radial and ulnar stability and still allows the ECU tendon to glide. Postoperative standardized ultrasound images were performed in 27 individuals, in 19 cases compared to the opposite side. The localization of the ECU tendon in relation to the ulnastyloid during supination was measured. Clinical function was assessed by measuring range of motion, grip strength and PROMs (Quick DASH, PRWE). The mean follow-up was 21 (4-100) months.

Results. In 2 of 34 of the operated patients an ulnar dislocation of the ECU tendon was confirmed. The others showed a variable ECU translation within the osseous groove, as described in healthy/asymptomatic subjects. Of these, 4 showed no translation, 5 showed translation to below the apex and 8 showed translation to the level of the apex of the osseous groove of the distal ulna. Clinical outcome varied depending on concomitant pathologies, treated during the same operation. There was no persistence of painful snapping in any of the patients after surgery. No revisions were necessary.

Discussion. Our technique provides sufficient stability to prevent painful snapping after ECU tendon stabilization. An asymptomatic ECU translation is present in most operated cases, to a similar extent as on the healthy opposite side. The clinical results are good to very good, depending on concomitant pathologies. Despite 2 complete dislocations, no revision surgery had to be performed. We present a low-complication rate in a reliable technique for the treatment of painful ECU tendon instability.

FM9

Ultrasound to Predict Tendinopathy from Distal Radius Volar Locking Plates

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Introduction. Recent epidemiological studies have revealed an increase in distal radius volar locking plate fixation over the last 20 years, with no

corresponding increase in hardware removal. Serious hardware complications, such as tendon irritation or rupture, remain a major concern, with rates of up to 4% reported. Despite recognition of risk factors [such as reduced volar tilt or Soong grade 2] clear clinical guidelines to aid the surgeon on necessity and timing of plate removal are yet to be established. Thus, the primary objective of this study is to investigate if ultrasound can identify tendinopathy secondary to distal radius volar locking plates.

Methods. All patients who received a removal of volar distal radius locking plate between March 2022 and January 2023 were included in this study. Preoperative clinical assessment included an examination for flexor tendon crepitus, pain during thumb or finger flexion, swelling of the forearm and carpal tunnel syndrome. Soong's grade was determined on x-ray prior to the removal. The presence of tenosynovitis, tendon fibre continuity, soft tissue cover of the plate and pronator quadratus function were preoperatively assessed with ultrasound and intraoperatively verified. The intraoperative measurements were compared to the preoperative findings, to determine any relationship between the two and whether the use of ultrasound is useful in identifying patients at risk of tendon pathology from volar wrist plates.

Results. We had a total of 46 patients (out of 47 recruited) who were assessed in the 3-step process. Mean age was 50 years (19-90 years). 7 patients had a Soong grad 0, 26 a grade 1 and 12 patients a grade 2. Intraoperatively, 28 patients showed a tenosynovitis and 8 a tendon fiber discontinuity. The preoperative clinical findings did not correlate with intraoperative tenosynovitis or tendon injury, and the relationship between intraoperative tendon fibre continuity and ultrasound flexor tendon morphology was not statistically significant ($p=0.68$). The relationship of soft tissue (plate cover and pronator quadratus function) sonographic measurements and intraoperative findings were significant (OR 5.82 (1.23-26.25) and 15.17 (1.67-137.44), and $p<0.022$ and $p<0.016$).

Conclusion. The ultrasound is able to assess soft tissue and pronator quadratus thickness but is not able to reliably predict tendon pathology. Clinical assessments of tendon irritation do not correlate with intraoperative findings.

Freie Mitteilungen / Communications libres II: Wrist & Miscellaneous

FM10

Is dart-throwing motion used during activities of daily living?

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¹Zürich)

Introduction. The dart-throwing motion (DTM) is a wrist motion along an oblique plane from radial extension to ulnar flexion. We recorded 2020 the DTM in healthy volunteers and patients following radioscapheolunate (RSL) fusion and midcarpal (MC) fusion with three-dimensional motion capture system in vivo, using digital infrared cameras to track the movement of reflective skin markers on the hand and forearm. The aim of this study was to confirm the DTM to be the major movement plane during four activities of daily living (ADL): hammering and opening a jar, a bottle and a yoghurt.

Method. Twenty healthy volunteers and patients who had been treated by RSL (n=7) or MC fusion (n=9) were recorded with a 3D motion capture system during the performance of four ADL's: hammering, opening a jar, bottle and yoghurt. The wrist joint angles were calculated and the plane of the DTM was defined by fitting a linear trend line of best fit to the plotted data of the flexion-extension angle against the radial-ulnar deviation angle for each DTM and ADL trial. The angle of this regression line to the flexion axis was then calculated using standard trigonometric functions.

Results. Overall, wrist motion has been approximated to the DTM (24°) when hammering (35°) and opening a yoghurt (28°), but not during opening a bottle (-35°) or a jar (-31°). There was no significant difference of the calculated angle of the linear trend line between patients after RSL and MC fusion ($p>0.25$) or between healthy subjects and RSL ($p>0.08$) or MC ($p>0.25$) patients' group. Furthermore, motion patterns were inconsistent among the group in the jar and yoghurt opening tasks. Despite DTM was confirmed for opening a yoghurt, two healthy and one RSL patient did move in a plane oblique to the DTM plane. For opening a jar, wrist motion has been approximated to the DTM in seven healthy subjects and one RSL patient, while the other participants moved from ulnar-flexion to radial-extension. During opening a

bottle, most participants executed a circular movement in the wrist that could not be represented by fitting a linear trend line.

Conclusion. The DTM was confirmed in 50% of the examined ADL's in the healthy group and patients after RSL and MC fusion. The range of motion of the patients after RSL fusion was in ADL's with and without confirmed DTM significantly reduced compared to the patients after MC fusion. RSL fusion allow not better wrist function during ADL's by preserving the DTM.

FM11

Ultrasound-based measure of dorsal scaphoid displacement during Watson test in SL ligament lesions

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¹Zürich)

Purpose. Scapholunate ligament lesion is the most common ligament lesion in the wrist. Magnetic resonance imaging (MRI) with intraarticular contrast medium has a sensitivity to detect disruption of the ligament of 90%. The purpose of this study was to measure the sonographic dorsal scaphoid displacement during scaphoid shift test (Watson) in patients with scapholunate ligament lesion and to assess the reliability of the method.

Methods. 20 patients with MRI and intraoperatively confirmed scapholunate ligament lesions were assessed preoperatively between July 2020 and April 2023. Sonography was performed in wrist neutral position and during Watson test and compared with the healthy contralateral side. The distance between the dorsal surface of the scaphoid and the dorsal surface of the lunate was measured by two independent investigators and one investigator repeated the measurements at another timepoint for determination of inter- and intrarater reliability.

Results. We found a statistically significant difference between the dorsal subluxation of the scaphoid of the healthy (0.89 mm, SD 0.67 mm) compared to the pathological side (1.67 mm, SD 0.95 mm). Intrarater as well as interrater reliability was very good (ICC>0.7 (CI 95%) and SEM was lower than 0.4mm for all measurements).

Conclusion. Sonographic measurement of dorsal scaphoid displacement during Watson test showed promising results with very good inter- and intrarater reliability and therefore is a good and wide available tool which can be adopted for the detection of SL ligament lesions.

FM12

Anthropometric 3D Analysis of the Radial and Ulnar Bowing Using the Central Line Method

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Objectives. Three-dimensional (3D) understanding of the combined forearm anatomy is crucial to improve anatomic fixation of forearm fractures, enhance accuracy in correction osteotomy or refine osteosynthesis and prosthetic implants especially the ulnar head prosthesis. Most analyses use the two-dimensional surface of the bones, but not a reduce-to-point or reduce-to-line method. Likewise, no study investigated the three-dimensional correlation of the radial and the ulnar bowing.

Methods. CT scans of forearms of thirty healthy and asymptomatic patients were analyzed by using a three-dimensional surface calculation program. Each 3D bone model was divided along the functional forearm rotation axis into 10 equal parts to obtain 11 radial and ulnar cross-sections with a central point each. The connection of these central points led to the central line which then was analyzed in regard of bowing in the 3D space. This central-line-method allowed to find deformity planes out of the usually discussed coronal and sagittal planes as well as to analysis deviations of the anatomical axis eg. at the distal end of the ulna.

Results. The mean axis deviation of the radius is 6.45 mm at 52% of the total length (from proximal to distal) in the coronal plane, 1.35 mm at 38% in the sagittal plane and 7.28mm at 41% in the main deformity plane. The mean axis deviation of the ulna is 8.26 mm at 27% of the total length (from proximal to distal) in the coronal plane, 9.49 mm at 26% in the sagittal plane and 12.68 mm at 7.7% in the main deformity plane. The main deformity plane for the radius and ulna is oriented radio-dorsal with a dorsal tilt of 15° for the radius and 63° for the ulna. An average deviation of the medullary canal of 0.5° towards ulnar and 11° towards dorsal was found at 22 mm and 0.3° ulnar and 8° dorsal at 44mm from the distal ulna respectively. No strong correlation could be found between radial and ulnar bowing in the ulno-radial plane ($R^2 < 0.01$), dorso-palmar plane ($R^2 = 0.04$) or along the main deformity axis ($R^2 = 0.16$).

Conclusion. The central line method enables to describe bowing of the forearm and to find deformity planes out of the standard coronal and sagittal plane.

This study provides clinically relevant anthropometric data for corrective osteotomy and implantation of ulnar head prosthesis. In case of isolated increased bowing of the radius or ulna, no strong positive or negative correlation can be expected on the other bone.

FM13

Long-term results after semiconstrained distal radioulnar joint arthroplasty

Martina Greminger¹, Laima Bandzaite¹, Maurizio Calcagni¹ (¹Zürich)

Purpose. Arthroplasty of the distal radioulnar joint (DRUJ) using a semiconstrained implant yields good outcomes according to the literature. The aim of this study is to investigate outcomes in 34 patients operated in our institution between 2010 and 2021 and compare them with our previously published follow-up results in 2019 and 2016.

Methods. 36 patients were operated in our institution between 2010 and 2021 for a symptomatic condition of the DRUJ with a semiconstrained implant (Scheker). Two patients were lost to follow-up. 34 Patients completed patient-rated wrist/hand evaluation (PRWHE) questionnaires. The primary endpoint of this study is to assess weight-bearing ability and active range of motion of the DRUJ after implantation of a Scheker total distal radioulnar joint prosthesis. Secondary objectives are to explore the X-rays especially for stability and explore the relationship between clinical and patient-reported outcomes postoperatively. Details about concomitant procedures and subsequent revision surgery is collected.

Results. We report our results of 34 patients operated in our institution with a semiconstrained distal radioulnar joint prosthesis (Scheker) between 2010 and 2021. Results are compared with our previously published follow-up investigations in 2019 and 2016. Mean follow-up was 5.3 years. The average age of examined patients was 51 years. The arthroplasty indication was osteoarthritis and/or instability of the DRUJ. Overall pain reduction was significant and active range of motion as well as weight-bearing ability was stable over time. We observed no infection or wound healing problems. Our investigation in 2019 showed a relatively high complication rate with nerve irritation problems (2), heterotopic ossifications and implant loosening (2), ulnar impaction syndrome (1) and allergic reaction to the metal alloy (1) requiring revision surgery. This

current study shows lower complication rates in patients operated after our last investigation.

Conclusion. Arthroplasty with the semiconstrained DRUJ implant reduces pain and improves function. The complication rate was high in the first nine patients treated at our facility. We observed a learning curve with lower complication rate in our recent investigation. An extremely precise surgical technique is mandatory to avoid complications.

FM14

Influence of delayed surgery of scaphoid non-unions on healing rate

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Background. Diagnosis of scaphoid non-unions is often delayed, usually because of missing fracture signs on x-rays as first line diagnostics. Whether the healing rate is less or similar in delayed surgery, compared to early surgery is unclear.

Methods. A retrospective data analysis was performed of scaphoid reconstructions in patients with non-unions between 2002 and 2020. General demographics, data of treatment and follow ups were collected. Consolidation was assessed in computer tomography and in a few cases in x-rays. Patients were distributed into 5 groups. In group 1 with the time from accident to indication for surgery below 3m (m=months) were 24 patients, group 2: 21 patients (3-6m), group 3: 31 patients (6-12m), group 4: 23 patients (12-24m), group 5: 23 patients (>24m).

Results. 122 patients (110 male, 12 female) were included, mean age at surgery 28y (y = years, standard deviation 12). 65 were smokers, 26 non-smokers and 31 unknown. The utilized bone grafts were radius spongiosa in 16 cases, iliac crest in 50, vascularized graft in 55, none in 1. The reconstructions healed in 109 patients and did not in 13. Median days from accident to indication for surgery were 422 days for non-consolidated reconstructions und 241 for consolidated (p=0.05). There was a statistically significant association between time to consolidation and time to surgery (p<0.001). Difference in sex, smoker status and bone graft between consolidated and non-consolidated patients was not significant (p=0.36-1). Of all healed reconstructions, in group 1 100% (n=22) healed within 6m and in groups 2-5 86-100% (n=17-24) within 1y. The time for consolidation was independent from sex, smoker status (p=0.22-0.82), but significantly longer in patients with vascularized bone graft (p=0.03). In

group 1-4 a pseudarthrosis persisted in 5-10% (n=1-3) and in group 5 in 22% (n=5). Of these, 6 were reconstructed and 7 denied another surgery.

Conclusion. Delayed surgery of scaphoid non-union 3m to even >2y after the accident seems to yield a good potential for healing. However, when surgery is performed more than 2y after the accident the risk for a permanent pseudarthrosis is higher.

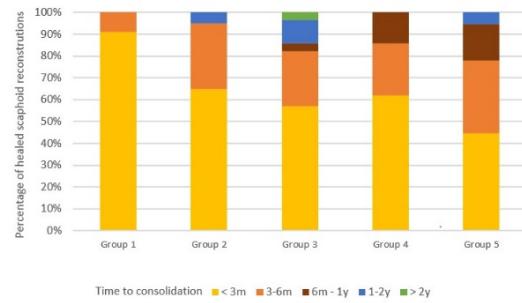


Figure 1. Percentage of healed scaphoid reconstructions consolidated within 3 months to >2 years with healed reconstructions represented as 100%. Non-consolidated reconstructions are not represented in this graph. M = months, y = years

FM15

Rotation axes of carpal joints in the healthy wrist and after scaphoid or lunate replacement

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Introduction. Carpal kinematics depends on the complex carpal architecture with multiple joints and intrinsic and extrinsic ligaments interacting with each other. The use of 4D-CT has brought new insights to this topic and allows for a more detailed analysis of the isolated joints. A thorough understanding of wrist kinematics is mandatory when aiming for restoration of wrist function with ligament reconstructions or carpal bone replacements. The aim of this study was to define rotational axes of the carpal joints in healthy volunteers and in cadaver wrists after lunate or scaphoid replacement with intrinsic and extrinsic ligament reconstruction. This leads to a better understanding of the interactions of the carpals in a healthy wrist and whether it is possible to restore rotational axes by replacing the scaphoid or the lunate. This study was supported by Medartis AG and Arthrex.

Material and Methods. 21 subjects with healthy wrists underwent 4D-CT scans of both wrists. 14 cadaver wrists underwent 4D-CT scans before and after scaphoid ($n=8$) or lunate replacement ($n=6$) with intrinsic (SLL/LT) and extrinsic (LRL) ligament reconstruction. Rotation axes of the scapho-lunate, scapho-radial, luno-triquetal and luno-radial joints were represented by finite helical axes (FHA). All rotation axes were reported with respect to a coordinate system based on the distal radius and an average FHA was calculated for each joint. The rotation axes of the cadaver wrists before and after carpal bone replacement and with intact and cut LRL-reconstruction were calculated and compared to the healthy subjects.

Results. Orientation of rotation axes showed substantial inter-individual differences. 68% of rotation axes of native cadavers lied within the range of axes of the healthy wrists. 53% of the cadaver axes after carpal replacement showed deviations $<5^\circ$ compared to the native state. 41% of the axes after lunate replacement showed $>5^\circ$ deviations between intact and cut LRL ligament.

Discussion. The large range of the orientation of rotation axes in healthy wrists reflects the high inter-individual differences of the bony shape of the carpals and thus, the orientation of the intercarpal joints. Most rotation axes of the native cadaver wrists were found within the range of healthy wrists, which in most cases was even preserved after scaphoid or lunate replacement. This indicates that scaphoid and lunate replacement allows to restore carpal kinematics close to normal in a cadaver model.

FM16 Arthroscopically versus openly treated scaphoid pseudo-arthrosis – A retrospective case-control study

Léna Dietrich¹, Dominique Merky¹, Rémy Liechti¹, Sarah Messerli¹, Esther Vögelin¹ (Bern)

Introduction. Currently, there is no consensus on the optimal surgical approach for scaphoid pseudo-arthrosis. Open bone grafting is likely to result in better carpal alignment than arthroscopic bone grafting, but is without known clinical relevance. The aim of this study was to compare clinical and radiological outcomes of arthroscopically and openly treated scaphoid pseudo-arthrosis focusing on function and time to consolidation.

Methods. This retrospective, comparative, monocentric case-control study included 51 patients with scaphoid pseudo-arthrosis treated either

arthroscopically (20) or through an open approach (31). We compared pain, range of motion of the wrist (versus contralateral side) in relation to flexion/extension, radial-/ulnarduction, pro-/supination as well as grip strength (percentage compared to opposite side). Further study parameters include DASH and Mayo Wrist score, time to consolidation, incidence of post-traumatic arthrosis, complications and revision rate. The aforementioned data was analyzed approximately 9 months after surgery.

Results. The mean operating time was 03:02 hours for the open approach versus 02:05 hours in arthroscopically treated pseudo-arthrosis (31% reduction). There was no difference in terms of postoperative pain. The average range of wrist motion, compared to the healthy contralateral side, consisted of flexion (arthr. 90%; open 84%), extension (arthr. 87%; open 89%), pronation (arthr. 100%; open 97%), supination (arthr. 97%; open 97%), radialduction (arthr. 84%; open 87%), ulnarduction (arthr. 80%; open 90%). Especially grip strength in the arthroscopic group (arthr. 85%; open 80%) showed clear superiority. The incidence of post-traumatic osteoarthritis and the reoperation rate were comparable.

Discussion. The arthroscopic procedure demonstrates a viable alternative to the open method with comparable postoperative subjective outcomes, a similarly satisfactory range of motion and comparable strength measurements. Operating time is significantly shorter in the arthroscopic approach and it can be done in an outpatient setting. Furthermore, the arthroscopic approach is associated with a potentially significant cost reduction. Therefore, this procedure proves an increasingly important alternative.

Conclusion. This study supports the treatment of scaphoid pseudo-arthrosis using an arthroscopic approach, a more time-efficient and cost effective alternative with comparable functional outcomes to the open approach.

FM17 Corrective Osteotomy of the Distal Radius without Bone Grafting and without Cortical Contact

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The aim of this study was to assess bone healing and secondary fracture displacement after corrective osteotomy of the distal radius without

any cortical contact using palmar locking plates without bone grafting. Between 2009 and 2021, 11 palmar corrective osteotomies of extra-articular malunited distal radius fractures and palmar plate fixations without the use of bone grafts and without cortical contact were assessed. All patients showed complete osseous restoration and significant improvement in all radiographic parameters. Except for one patient, there were no secondary dislocations or loss of reduction in the postoperative follow-up. Bone grafts may not be mandatory for bone healing and prevention of secondary fracture displacement after palmar corrective osteotomy without cortical contact and fixation with palmar locking plate.



Posteroanterior wrist radiograph after an open wedge osteotomy and palmar locking plate fixation without cortical contact and without bone grafting



Lateral radiograph

FM18

The Potential Benefit of AI regarding Clinical Decision-making in Treatment of Wrist Trauma Patients

Marco Keller¹, Meret Rohner², Florian Thieringer², Philipp Honigmann³ (¹Zürich; ²Basel; ³Bruderholz)

Introduction. The implementation of artificial intelligence (AI) in hand surgery and rehabilitation is gaining popularity. Many publications describe powerful AI-enabled algorithms targeting a variety of tasks with often equal or better diagnostic performances than human observers. Yet there's only very scarce evidence for real, measurable value in terms of patient outcomes, support of healthcare professionals in clinical decision-making or the potential socio-economic impact on the healthcare system. The aim of this experiment was to investigate the potential significance of artificial intelligence in the emergency treatment of wrist trauma patients.

Material/Method. For this experiment 22 physicians (divided in two groups) were confronted with twenty realistic cases of wrist trauma patients referring to the emergency room. 10 of the patients sustained a distal radius fracture and 10 suffered from a wrist contusion. The physicians had to find the correct diagnosis based on anamnestic, clinical and radiographic information and provide a treatment recommendation in a close-to-reality scenario with different options like adding diagnostic measurements or consulting a senior. One group was assisted by an AI-enabled application which detects and localizes distal radius fractures with near-to-perfect precision. The primary outcome measurement was the diagnostic precision (sensitivity and specificity). Secondary outcome measurements were required time, correctness of the treatment recommendation, number of CT scans and senior consultations, subjective (STAI questionnaire) and objective (HR, BP) stress levels.

Results. We found that the AI-enhanced group detected distal radius fractures with superior sensitivity ($p = 0.06$) and specificity (0.17) than the group without AI support. The differences were not significant. The AI-group used significantly less CT scans to reach the correct diagnosis ($p=0.02$). Furthermore, the AI-group was on average 9% (180 seconds) faster in answering the cases and significantly less stressed compared to the control group (p -value: 0.05).

Conclusion. Our findings suggest that physicians are more likely to make a correct diagnosis in wrist trauma patients if they are supported by an AI tool with a reduced number of additional diagnostic measurements. Furthermore, the AI tool seems to reduce the stress levels of the physicians during the investigation of the cases which is especially valuable in an increasingly stressful clinical environment.

Freie Mitteilungen / Communications libres III: Innovation

FM20

Corrective Cold Ablation Robot-Guided Laser Osteotomies in Wrist Surgery – a cadaver study

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Purpose. The purpose of this study is to show accuracy of a Cold Ablation Robot-Guided Laser Osteotome in pre-clinical cadaver tests performing osteotomies in the field of wrist- and forearm surgery.

Methods. Osteotomies were performed with CARLO® which is a miniaturized ablation laser with an optical system controlled by a navigation system. The energy of a laser pulse hitting the bone tissue heats up the water content of the bone and vaporizes it. The debris is being expelled immediately, providing a clean-cut line with preservation of the bone microstructure. CARLO® enables new cutting patterns that are impossible to achieve with conventional methods.

A total of 12 corrective laser-osteotomies were performed on the distal metaphyseal radius and ulna. The osteotomies were planned patient specific on a 3D CT-model prior to surgery using CARLO®'s planning software. On the radii six two plane adjustments were conducted lengthening the radius by 4mm and correcting radial inclination by 10° using a curved sine cut. On the ulnae one plane corrective osteotomies were performed shortening the ulna by 3mm using a sine cut as well. Pre-and postoperative CT-scans were taken to compare the virtual surgical planning with the post-operative results and to show accuracy of the cutting path.

Results. Accuracy measurements of the actual cutting path compared to the planned cut showed a mean deviation of 2.11mm in the osteotomies of the radii and 1.66mm on the ulnae. The inaccuracy could have several possible causes, most probable is that the surface registration was not done careful enough.

However, the resulting corrections showed great precision being at least as accurate as todays techniques using 3D printed patient specific cutting

guides and 3D planning methods. After fixation the radii revealed an average lengthening of 4.36mm (planned: 4.00mm), while radial inclination was corrected by 10.55° (planned: 10.00°). The ulnae showed an average correction of 3.05mm (planned: 3.00mm).

Conclusion. First cadaveric results show promising results concerning the accuracy of one and two plane osteotomies in wrist and forearm surgery using a Cold Ablation Robot-Guided Laser Osteotome. Accuracy testing showed that registration of the bone in relation to the patient marker is key to achieve a high precision, therefore it should be done carefully. Future steps are stability testing of the osteosynthesis followed by certification and first use in patients.

FM21

Preliminary data of a new integrated digital platform for remote rehabilitation in hand surgery

Maurizio Calcagni¹, Maurizio Calcagni¹, J Rodriguez², Ricardo Jauregui Telleira², Inga Besmens¹ (¹Zürich; ²Barcelona ES)

Rehabilitation is a central part of the treatment of hand and wrist conditions and it represents the most time-consuming part. Normally, rehabilitation take place partially in the office under the control of the therapist and partially alone at home. This second part is left to the compliance of the patient in term of number of sessions per week and of quality of the exercises. Remote rehabilitation can be a good solution to overcome these problems if a feed-back loop can be established between all the involved stakeholders. ReHub®, a new digital platform for remote rehabilitation that connects the surgeon, the therapist and the patient was developed to fulfil these needs. Based on the clinical information given by the physician, the therapist creates a personalised programme. The platform allows for an automatic tracking of the movements, the data recorded during the exercise are uploaded in the cloud and are used to monitor the improvements. The patient can answer to different questionnaires (PROMs). During the exercise the patient can interact with the platform to learn and monitor the right way to perform the exercises.

In 2021-2022. 50 patients were treated with ReHub® for different upper limb pathologies. Patients received a programme of 3 sessions a week for 4 weeks. The number of sessions executed, the Quick-DASH and the pain levels were measured at the beginning and after 2 and 4 weeks.

The diagnosis treated with ReHub® were 15 distal radius fracture, 10 carpal tunnel release and synovitis, 5 wrist sprain. The compliance rate was 66% and the drop-out rate was 6%. 34 patients filled the QuickDASH and its score improved in all cases of at least 15 points. Pain decreased steadily with an overall reduction of moderate (VAS 4-6) and intense (7-10) from 30.3% at the beginning, to 23.2% at 2 weeks and 6.9% after 4 weeks.

The ReHub® digital platform demonstrated a very high compliance with a very low drop-out rate of only 6%. QuickDASH value improved and pain was reduced significantly. These findings reflect the high satisfaction rate of this new digital tool. Physicians can follow-up the improvements, not only with the automatic movement recognition tool, but also through the PROMs filled out by the patients. The therapists can evaluate the compliance in term of time spent exercising and the quality of the movements. The system proved effective in the rehabilitation of common upper extremity conditions, with a high compliance and patients' satisfaction.

FM22

Biomechanical Stability and Viability of 3D Printed Bioresorbable Implants for Distal Radius Osteotomy

Alissa Gübeli¹, Adam Jakimiuk², Michaela Maintz², Florian Thieringer², Marco Keller³, Philipp Honigmann⁴ (¹Genève; ²Basel; ³Zürich; ⁴Bruderholz)

Objective. The fixation of distal radius osteotomy traditionally involves the use of titanium plates and screws, which has certain drawbacks such as soft tissue irritation, the need for removal in many cases, stress shielding, and potential patient intolerance or allergic reactions. In this study, we propose a new surgical technique utilizing 3D printed patient-specific implants made of bioresorbable material. We conducted an in vitro study to evaluate the biomechanical stability, biodegradability, and viability of these implants compared to standard titanium plates.

Methods. We performed an opening wedge osteotomy of the distal radius on five cadavers. The osteotomy was planned virtually using CT scans of the radii and executed with the assistance of 3D printed cutting guides. Cadaver-specific 3D printed wedges made of poly(L-lactide-co-D, L-lactide) with 30% β-tricalcium phosphate (PLDLLA/β-TCP) were inserted into the osteotomy gap. They were designed with a hole for fixation using Arthrex Bio-compression screws (3-3.7 mm). 3D printing was performed using the Arburg Plastic

Freeformer. Biomechanical tests were conducted to assess the strength of the fixation technique using the printed implants, comparing them to titanium plate implants. Mechanical tests involving tensile, compression, and bending forces were conducted on the printed implants to evaluate their mechanical performance. Biodegradation studies were carried out by submerging the implants in phosphate buffer solution (PBS) for up to 4 weeks.

Results. Biomechanical investigations indicated that the fixation method utilizing the 3D printed implants could withstand an average axial force of 1879.7 N, which is lower than the titanium plate (2415.55 N) but a load higher than typically encountered during falls. They thus have the potential to provide sufficient stability as an alternative to standard titanium plates. However, physico-chemical tests revealed material alterations caused by the 3D printing process.

Conclusion. Preliminary results of this study demonstrate promising biomechanical stability and viability of 3D printed bioresorbable implants for distal radius osteotomy. Since the 3D-printing process induced material alterations, further research is required to comprehensively evaluate the long-term viability and safety of this technique. If proven successful, these patient-specific implants could offer a beneficial alternative to traditional titanium plates.

FM23

Adipose stem cell spheroids as an emerging strategy for nerve tissue engineering applications

Srinivas Madduri¹, Margot Maytair¹, Veronique Serre-Beinier¹, Frédéric Triponez¹, Jean Villard¹, Daniel Kalbermatten¹ (¹Geneva)

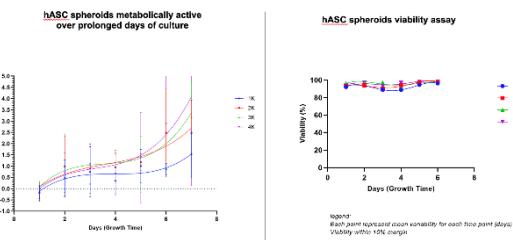
Introduction. The current treatment options of peripheral nerve injuries, despite substantial advancements, are still unsatisfactory. One promising approach is fibrin-hydrogel nerve conduits (FNCs) loaded with human adipose stem cells (hASCs) for nerve guidance, protection and for local release of neurotrophic factors (TNFs). The combination of FNCs and ASCs showed promising results in vitro and in vivo for nerve regeneration. Within this context, ASCs based spheroids are emerging for enhanced cytokine profile. However, their therapeutic effect on nerve regeneration is unknown. Thus, the present study aimed for fabrication and characterization of hASCs spheroids for nerve tissue engineering applications.

Methods. Spheroids based on hASC (passage 4 to 5) were generated using agarose microwell mould. For identifying the optimal culture conditions, various cell seeding densities (i.e., 1000 or 2000,

3000 and 4000 cells/spheroid) were used and the cultures were maintained over seven days. Subsequently, the spheroids were characterized by measuring the size, growth kinetics and intracellular ATP content.

Results. hASC spheroids have been well established. In general, the size and the ATP levels correlated to the cell seeding density. After a 24-hour period of compaction, the spheroid-size and the ATP content remained stable over 7 days for low-density spheroids. For the high density (i.e., 4000 cells/spheroid), the size and the ATP content showed a marked decline in the last days of culture (day 6 and 7).

Conclusion. We successfully established optimal conditions for fabrication of hASC spheroids for seven days. Monitoring the growth of spheroids with their size and ATP levels revealed early changes in spheroid viability. To further validate this model, NTFs expression profile will be analysed. Subsequently, spheroids will be combined with FNCs for treating the sciatic nerve injury in rats.



Adipose stem cell spheroids exhibit therapeutic potential over prolonged days of culture.

FM24

Long-term follow-up after digital nerve reconstruction with silk fibroin nerve conduit

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Introduction. Multiple techniques are available for reconstruction of digital nerve defects using autograft, allograft and conduits. So far, comparative studies demonstrate variable results ranging from no difference in sensory outcomes to superior recovery with allograft and autograft reconstruction. SILKBridge®, a novel hybrid three-layered tube based on silk fibroin (obtained from the silk of *Bombyx mori*) was developed with optimized characteristics for peripheral nerve regeneration. The device has two electrospun layers (inner and outer) and an intermediate textile one. The first in-human pilot study of digital nerve

reconstruction with SILKBridge® was performed in our institution and has proven its feasibility, safety and efficiency in the mid-term follow-up. We examined the long-term results in terms of function, patient satisfaction and biological behavior of the silk fibroin device.

Patients and methods. This is a follow-up study including patients with digital finger reconstruction with SILKBridge® following traumatic injury or neuroma resection. We collected data from last follow-up during routine clinical controls. Two-point discrimination, Tinel sign, local soft tissue conditions and pain were assessed. Ultrasound examination was performed for long term evaluation of conduit integration properties.

Results. In total four patients were included with median follow-up time of 3 years (1-3.5). All patients showed a good sensation recovery with a static 2-point discrimination of 5-12mm, a moving 2-PD of 4-10mm. No local signs of chronic inflammation or foreign body reaction were observed and a Tinel sign was absent in all patients. The scar was soft and the digital range of motion was the same on both sides. All patients were pain free and satisfied with the result, while no one reported a foreign body sensation. The silk conduit was still visible in the ultrasound but without signs of scar tethering or soft tissue reaction.

Discussion. This is the first long-term follow-up after digital nerve reconstruction with the hybrid, multi-layered silk fibroin device SILKBridge®. So far, functional results and patient satisfaction are excellent with no adverse events. SILKBridge® appears to be a safe and efficient alternative to nerve autografts or allografts in cases of digital nerve defects with very good long-term biological behavior.

FM25 Ultrasound controlled mini-invasive A1 pulley release using a new guide instrument - a case series

*Nora Schlimme¹, Esther Vögelin¹, Damian Sutter¹
(¹Bern)*

Objectives. With percutaneous pulley release becoming more popular, safety and reliability of this mini-invasive procedure remain a concern. Visualization of the surgical steps by ultrasound suggests increased safety but also highlights the proximity of tendons, nerves and vessels as well as the potential for damage to these structures. Therefore, proper instrumentation is crucial. We present the results of implementing sonographically

guided mini-invasive A1 pulley release using a newly designed guide instrument and a commercial hook knife.

Methods. Initially, basics for the technique using an early version of the guide instrument were established in cadaver hands. The instrument design was subsequently refined. Between November 2019 and December 2022 a total of 128 sonographically guided A1 pulley release procedures were performed in 79 patients.

The guide instrument is inserted through a small incision at the base of the finger and enters the flexor tendon sheath between the A1 and A2 pulley. It is advanced proximally between the flexor tendon and the A1 pulley under sonographic visualization. Once in position, the hook knife is inserted through the channel in the guide instrument. The central position over the pulley is sonographically confirmed, before turning the hook knife 90°. Finally, the pulley is released by retracting the hook knife distally.

Results and Conclusions. Complications include one case of inadvertent skin laceration, one case of postoperative infection and one CRPS. Postoperative recurrence of a trigger finger due to incomplete pulley release was noted in 3 cases, in one of which the issue was resolved sonographically. The second had a remission after cortisone infiltration while the last underwent open pulley release revealing an intact A1 pulley. Intraoperative conversion to open release was performed in 5 cases due to an unfavorable position of the hook knife or persistent trigger finger intraoperatively. Of the 79 operated patients 68 (106 of 128 A1 pulley releases) reported return to strenuous activities within two weeks. No injuries to nerves, vessels or tendons occurred.

In conclusion, the choice of appropriate surgical instruments and practice allows for safe and efficient implementation of a mini-invasive procedure in pulley release.

FM26 Biodegradable Temporising Matrix - a reliable flap alternative for reconstruction extremity defects

Lena Fuest¹, Esther Vögelin² (¹Zürich; ²Bern)

Introduction. Treatment of skin defects on the hand with exposed tendons, nerves or bones after severe trauma/infections can be a reconstructive challenge. Biodegradable Temporising Matrix (BTM®) may serve as a new soft tissue cover

alternative if skin grafts alone do not heal and flaps are not an option, especially in patients that are not ideal candidates for major complex microsurgical reconstruction. BTM is a synthetic polyurethane dermal substitute. This case series represents the first study evaluating the efficacy of BTM in no-burns reconstruction.

Method. In the year 2022, 27 patients were treated with BTM. In 20 cases the soft tissue defect was caused by a severe trauma. In four patients, there was a skin defect after an infection and in one case each, it was caused by an epitheloid sarcoma, by Dupuytren's disease and by MDA5 Dermatomyositis. 59% of the patients were male, the median age was 51 years. Four patients suffered from an amputation of a finger, 18 patients had a substantial defect at the dorsum of the hand, three patients at the forearm, and one patient each had a defect at the thenar or palm. The size of the skin defect ranged from 1 to 200 cm². Following debridement, BTM was applied to the wound. After the granulation tissue has fully integrated into the BTM layer, the sealing membrane is removed and a new, vascularized dermal layer emerges. A split-thickness skin graft was then applied.

Results. On average, the delay between covering the soft tissue defect with BTM and the application of a split-thickness skin graft was 36 days. BTM was applied in 9 cases on exposed extensor tendons, in 4 cases on muscle or soft tissue, in 5 cases on bone, in 2 cases on the neurovascular bundle and in 1 case each on exposed flexor tendon and nerve transfer. One infection with enterobacter cloacae was observed. The split-thickness graft was well integrated after five days. At follow-up the ROM was satisfying according to the accompanying injuries.

Conclusion. According to the statistics and experience gained, the use of BTM demonstrates enormous potential in healing complex wounds. It shows reliable healing and the scars after BTM application and split thickness skin grafts were aesthetically very pleasing. Coverage of tendons, nerves and bones are possible as well as coverage of infected wounds. The method should be preferred especially in patients, who do not qualify for a vascularized free or pedicled flap with reduced mobility requirements.

FM27

Automated Detection and Localization of Distal Radius Fractures using a Convolutional Neural Network

*Marco Keller¹, Philipp Honigmann², Cédric Huwyler³, Martin Melchior³, Florian Thieringer⁴,
¹Zürich; ²Bruderholz; ³Windisch; ⁴Basel)*

Introduction. Deep Learning and especially Convolutional Neural Networks (CNN) have established themselves as state-of-the-art methods in the field of image and object detection throughout the last decade. In health care they are successfully used, for example, to detect skin or breast cancer, where they reach the level of an expert opinion.

The aim of this study was to build an deep learning algorithm which is able to automatically recognize the region of interest on standard radiographs, automatically identify and localize distal radius fractures.

Material/Method. A database of conventional radiographs taken from 729 patients was manually built and labelled to serve as ground truth. 409 of these patients sustained a distal radius fracture (verified with X-rays, CT scans and clinical information from follow-up-appointments) and 320 were healthy individuals. By using all wrist X-rays from one institution from one calendar year we achieved a close-to-reality, wide variability of fracture configurations and patient demographics. The dataset was divided into a training- and a test-set. Several object detection deep learning models were trained to recognize the region of interest, to detect and localize distal radius fractures (if present). Furthermore, we explored if using one or two projections (dorsopalmar and lateral) and the addition of demographic data (age, gender) to the algorithm would change the models performance. The CNN model was compared to human observers in order to explore the clinical relevance.

Results. Our best model detected distal radius fractures on dorsopalmar radiographs with an accuracy of 98.5% and an AUC of 0.995 improving on the human baseline accuracy by 18.5%. This corresponds to a sensitivity of 0.987 and a specificity of 0.987. The addition of a second projection (lateral) or demographic data didn't improve the performance, but the model became more confident in its prediction. The region of interest was reliably recognized using automated detection of three landmark points which led to the inclusion of 99% of all fractures.

Conclusion. Our deep learning model showed high accuracy in the detection and localization of distal radius fractures. In our test setup, it exceeded the performance of human observers. These kinds of Convolutional Neural Networks have the potential to improve the efficiency of healthcare workers and substantially change our way of patient care in the

FM28

A new grip strength measurement device – considering handle diameters and forearm rotations

Gabriella Fischer¹, Maurizio Calcagni¹, Tassilo Schirmer¹, Pascal Schütz¹ (¹Zürich)

Introduction. Grip strength measurement with dynamometers (Jamar) have proven reliable and valid. However, the specific geometry of its handles require a grip position that is rarely found during daily activities. With regard to functional outcome assessments, the aim of this study was to establish a cylindrical hand grip strength device (HGS) and investigate the impact of different handle diameters and forearm rotations on power grip force.

Methods. 25 healthy participants were examined with the HGS during maximum effort trials in a test-retest study using handle diameters of 30mm, 60mm or 100mm, as well as neutral, pronated or supinated forearm rotation. Concurrent validity to the clinical standard (Jamar) was established. Maximum force was compared between conditions and minimal detectable differences (MDD) was evaluated.

Results. Reliability of the HGS (ICC =0.96, range [.90, .99]) for all observed conditions as well as concurrent validity and device correlation ($r=0.91$ [.71, .99]) were found to be excellent. Between-session MDD were 83.6N, 85.5N and 32.5N for the 30mm, 60mm and 100mm HGS, respectively, which constitutes of 12.1-16.0% of measured force.

Grip forces were found significantly different between handle diameters ($p<0.0001$) and forearm positions ($p<0.0003$). Across all positions, the smaller the diameter, the larger the observed gripping force. Interestingly, the grip force with HGS 30mm was larger in supination than in neutral position while using HGS 60mm, the highest grip force was reached in the neutral position, followed by supination.

Conclusion. The reliability of the new HGS was similar or better compared to the clinical standard.

Measured grip strength significantly depends on the diameter of the handle and forearm rotation. As

known from the ulnar impaction syndrome, pathologies can have an increased influence on grip strength in different positions. We therefore point out the necessity to investigate non-neutral positions and different handle diameters in order to understand healthy and pathological power grip force and its implication on daily activities.

The presented HGS with its cylindrical design in relevant diameters for daily activities are mobile, easy to use, and now proved to be reliable and valid to be used in a clinical setting. They allow continuous recording of grip force and advanced analysis of grip force characteristics, such as loading-rate or centre-of-pressure, to get a more in-depth understanding of grip force characteristics in different pathologies.

Freie Mitteilungen / Communications libres IV: Finger joints & Miscellaneous

FM40 Is PIP surface replacement recommended in patients with severe longitudinal joint axis deviation?

Xenia Startseva¹, Miriam Marks¹, Daniel B. Herren¹, Stephan Schindeler¹ (Zürich)

Objective: The aim was to compare the 2-year outcomes after proximal interphalangeal (PIP) joint surface replacement in joints with more than 15° preoperative deviation to the longitudinal finger axis versus joints without any preoperative deviation.

Methods: Patients who received a primary single surface replacing PIP arthroplasty (CapFlex PIP, KLS Martin, Germany) were included. Longitudinal finger axis deviation at the PIP joint level was measured and classified as: no deviation (<5° deviation to the longitudinal finger axis), moderate deviation (5°-15°) or severe deviation (>15°). Active range of motion (ROM) of the PIP joint was measured. Patients completed the brief Michigan Hand Questionnaire (MHQ) and rated their pain during daily activities on a Numeric Rating Scale (0-10). Baseline and 2-year outcomes between patients with and without deviations were compared with the Mann-Whitney U test.

Results: Out of 216 fingers initially operated, there were 7 (3.2%) that required revision surgery. Four fingers had severe axis deviation before surgery and 3 were classified with moderate deviation. The reasons for revision were stiffness (n=4), suspected metal intolerance (n=1), late low-grade infection (n=1), and luxation of the implant components (n=1).

Before surgery, 47 patients had a severe axis deviation and 39 had no deviation. At the 2-year follow-up, only 4 of the 47 patients still had a severe axis deviation; all remaining fingers could be corrected to a deviation of less than 15°. At 2 years, patients with severe and without deviation had a mean ROM of 63° (95% Confidence Interval [CI]: 58-68) and 59° (CI: 52-65) ($p=0.4$), respectively. In addition, the respective mean pain scores were 2.1 (CI: 1.4-2.8) and 1.7 (CI: 1.2-2.2) ($p=0.8$), and the brief MHQ scores were 72 (CI: 66-79) and 75 (CI: 71-80) ($p=0.7$).

Conclusion: Clinical and patient-reported outcomes at 2 years were similar between patients with severe and without preoperative axis deviation, and the joint axis could be corrected in most cases. The incidence of PIP joint revision surgeries was higher with a preoperative longitudinal joint axis deviation, yet the reasons for revision cannot be directly related to this factor. Stiffness may be related to axis deviation, as these joints were immobilized longer after surgery than straight fingers. We recommend a surface replacing implant to correct severe axis deviations, but the risk of revision surgery needs to be considered.

FM41 Complications after thumb CMC implant arthroplasty: Our 5-year experience

Daniel Herren¹, Miriam Marks¹, Stephan Schindeler¹ (Zürich)

Aim: The aim was to provide a comprehensive assessment of complications and revision surgeries up to 5 years after thumb carpometacarpal (CMC) dual-mobility implant arthroplasty.

Methods: All patients with osteoarthritis of the thumb CMC joint who underwent primary implant arthroplasty (Touch®, KeriMedical) between June 2018 and April 2023 were prospectively documented in a registry and included in this analysis. Intra- and postoperative complications and its treatment strategies were documented. Clinical (key pinch, grip strength) and patient-reported outcomes (pain, brief Michigan Hand Outcomes Questionnaire) before surgery and at 2-year follow-up were compared between patients with and without complications using an independent t-test. Implant survival up to 5 years was estimated using the Kaplan-Meier method.

Results: A total of 281 patients with a mean age of 64 (± 9) years were included. Thirty-three complications (12%) occurred and 8 implants (2.8%) required revision, resulting in an estimated 5-year survival rate of 96% (95% confidence interval: 92%-98%). Reasons for revision were symptomatic implant loosening, dislocation, or migration. In 4 cases the components were changed and in the other 4 cases a resection arthroplasty was performed. The most frequent other complications were de Quervain tenosynovitis (n=12) and trigger thumb (n=6), which were treated with either steroid injections or soft tissue surgery. There were also 3 cases of intraoperative trapezium fractures that were successfully fixed with a suture cerclage. There were no differences in the 2-year outcomes

between patients with and without complications ($p>1$).

Conclusion: Thumb CMC dual-mobility implant arthroplasty shows high implant survival and soft-tissue complications can usually be resolved with an injection or minor surgery. The reasons for revision were mainly iatrogenic, i.e. implant placement was not optimal in our first cases or we tried to implant a prosthesis despite a small or insufficient trapezium. Therefore, we recommend good training of the surgeon and careful indication.

FM42

Basal osteotomy of the first metacarpal using patient-specific guides – Clinical & 3D CT-based analysis

Lisa Reissner¹, Andreas Schweizer¹ (Zürich)

Introduction: Combined extending and ulnar adduction osteotomy using patient-specific guides and instrumentation showed good results in early-stage thumb arthritis. The aim was to investigate the subjective and clinical results of ten early to advanced stage trapeziometacarpal osteoarthritis and to compare the joint loading area before and after surgery.

Method: Between November 2020 and December 2021, we included nine patients with early to advanced trapeziometacarpal osteoarthritis in a prospective observational study who underwent Wilson extension osteotomy using preoperative 3D planning and patient-specific guides at our institution. Preoperative and one-year postoperative subjective assessment was based on a visual analogue scale (VAS) for pain and MHQ score. Range of motion (ROM) and grip strength data were investigated. Postoperative computed tomography with the corresponding 3D models was used for comparison with the preoperative plan. For the measurement of the minimum joint space between the trapezium and the first metacarpal bone, the bone-to-bone distance maps were calculated with the CASPA

Result: Pain and patient satisfaction improved significantly at the one-year follow-up. The mean ROM of the metacarpophalangeal and interphalangeal joints was similar to the preoperative ROM. The minimum joint space distance remained approximately unchanged from preoperative to postoperative, with a mean distance of 0.1 mm (SD 0.2 mm) preoperatively to 0.2 mm (SD 0.3 mm) postoperatively. The peak load zone of the trapezium articular surface shifted postoperatively by an average of 0.4 mm (SD 1.4

mm) ($p=0.110$) to radial and 0.1 mm (SD 1.2 mm) ($p=0.515$) to volar.

Conclusion: Extension and ulnar adduction osteotomy were found to result in satisfactory patient condition not only in Eaton stage I but also in II and III osteoarthritis, possibly leading to a change in the loading pattern of the joint surfaces. However, computed tomography-based three-dimensional analyses could not show a significant displacement of the peak load zone in dorsal-radial direction, as the values obtained are considered too small. Nevertheless, trends emerged suggesting that flatter pressure distribution and a dorsal displacement of the peak load zone could contribute to an improvement in pain and patient satisfaction.

FM43

Quantitative stiffness analysis of the proximal interphalangeal joint after joint replacement

Gabriella Fischer¹, Maurizio Calcagni¹, Raphael Surbeck¹, Esin Rothenfluh¹, William R. Taylor¹, Lisa Reissner¹ (Zürich)

Introduction: One of the most challenging problems of hand surgery is the treatment (and prevention) of proximal interphalangeal (PIP) joint stiffness. At present, functional outcome measures are mostly based on range-of-motion in the finger joints. We propose a method for the quantitative assessment of PIP joint stiffness and applied it in patients after PIP joint replacement surgery.

Methods : Seven patients with a minimum follow-up period of 1 year since PIP implant arthroplasty (Swanson or CapFlex) in context of osteoarthritis (OA) were included. PIP joint stiffness of all long fingers in both hands was measured, using a newly developed finger stiffness measurement device (FSMD) and assigned to the following categories: healthy, Swanson, CapFlex, and symptomatic OA. The FSMD passively moves the tested finger and registers the exerted torque during a preset angle sequence (safety threshold of $\pm 0.2\text{Nm}$). The slopes of the recorded torque-angle curves represent joint stiffness.

Results: Among a total number of 56 PIP joints, 12 were healthy, 3 replaced with a Swanson prosthesis, 19 CapFlex prosthesis and 8 symptomatic OA.

Over all measured joints, PIP joint stiffness was lower in intermediate flexion positions and increased towards end positions of the joint (figure 1); e.g. median stiffness was 1.5Nmm° [range 0.6-5.6], 1.7Nmm° [0.5-18.9] and 3.3Nmm° [1.0-

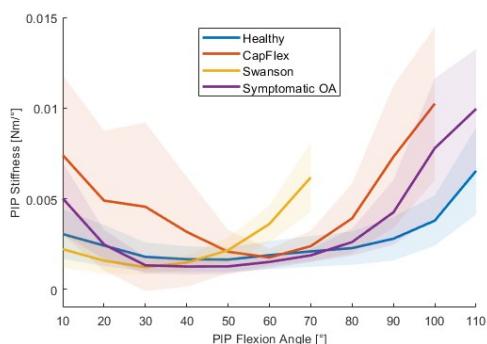
15.7] at 50°, 30° and 90° PIP flexion, respectively. Within the set torque threshold, two fingers with a CapFlex prosthesis were not able to reach flexion angles $\leq 30^\circ$, while all three Swanson PIP did not reach flexion angles $\geq 90^\circ$.

Discussion and Conclusion: Measurement with the FSMD provides torque-angle data, which enables calculation of joint stiffness throughout the ROM of a finger's PIP joint. We present the results in a small number of patients, offering preliminary data for the chosen, specific subgroup after PIP joint replacement surgery.

PIP joints with a Swanson prosthesis tend to be less stiff in more extended positions and become considerably stiffer at finger flexion angles $> 60^\circ$.

PIP joints with a CapFlex prosthesis tend to be particularly stiffer in more extended positions. Furthermore, this group showed a large variance for stiffness in the extended positions, i.e. while some could not even reach flexion angles of $< 30^\circ$, others delivered values equal to healthy joints.

In a future perspective, measurement and a systematic analysis in a larger number of patients is required for the introduction of this novel method to assess and quantify finger joint stiffness.



PIP joint stiffness for healthy fingers and different treatment groups

FM44

Can we correct hyperextension of the MCP joint with thumb CMC implant arthroplasty?

*Vanessa Reischenböck¹, Jenny Imhof¹, Miriam Marks¹, Stephan Schindeler¹, Daniel B. Herren¹
¹Zürich)*

Aims: The primary objective was to examine whether thumb carpometacarpal (CMC) implant arthroplasty can correct hyperextension in the thumb metacarpophalangeal (MCP) joint. As a secondary outcome, clinical outcomes one-year

post-surgery were compared between patients with and without MCP hyperextension.

Methods: Patients treated with a thumb CMC implant arthroplasty (Touch®, KeriMedical, Switzerland) who were prospectively documented in a registry and had complete baseline and 1-year follow-up data were included. Hand function was assessed with the brief Michigan Hand Outcomes Questionnaire (brief MHQ, score 0-100). Key pinch strength was assessed with a pinch gauge and range of motion of the MCP joint with a goniometer. Differences between baseline and follow-up were analysed with the Wilcoxon signed-rank test. The outcomes of patients with a preoperative MCP extension of $> 20^\circ$ (hyperextension group) were compared to the outcomes of patients with $\leq 20^\circ$ using the Wilcoxon rank-sum test.

Results: We included 172 patients of whom 41 had a preoperative MCP hyperextension of $> 20^\circ$ and 131 patients had no hyperextension. In the hyperextension group, MCP extension was corrected from preoperative mean 33° (95% confidence interval CI: 31-35) to 10° (CI: 6-13) at 1 year ($p \leq 0.001$). Patients in the control group had a preoperative MCP extension of 10° (CI: 9-12) which was reduced to 5° (CI: 4-7) at 1 year ($p \leq 0.001$). Patients with preoperative MCP hyperextension had lower key pinch strength at 1 year compared to the control group (5.9 kg (CI: 5.3-6.6) vs. 7.0 kg (CI: 6.7-7.5), $p \leq 0.01$). The brief MHQ did not differ between the groups (85 (CI: 82-88) vs. 87 (CI: 82-92), $p=0.7$). Complications appeared in 29 patients of whom 7 had preoperative MCP hyperextension. No significant association between hyperextension and complications was observed ($p=1.0$).

In our registry, there are 8 patients who dropped out of the data collection, because they underwent revision surgery. Only one of them had a preoperative MCP hyperextension, indicating that there is no association between preoperative MCP hyperextension and revision surgery.

Conclusion: Thumb CMC implant arthroplasty can correct preoperative MCP hyperextension, and preoperative MCP hyperextension does not appear to increase complications. Therefore, we recommend using implant arthroplasty also in patients with hyperextension of the MCP joint, provided the joint is stably otherwise.

FM45

2D/3D Analysis of the axis & angle for closing wedge-OT of the MC I for early-stage OA of the CMC I

Philip Honigmann¹, Jasmine Rüegg², Marco Keller¹, Mathias Häfeli³ (¹*Bruderholz;*
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Purpose: The aim of this project is to define the necessary axes (anatomical, mechanical and adjacent joint axis) of the first metacarpal bone in order to calculate a first metacarpal tilt angle and to determine a correction angle to be used in a Wilson osteotomy.

Material and Methods: CT-scans of twenty healthy and six symptomatic patients were used to find a method to define the required axes. Once the axes were defined, the first metacarpal tilt angle could be determined. This value was compared between healthy and symptomatic data. The angle of the closing wedge in a Wilson osteotomy was calculated and explained with the defined axes and the determined angles. The effect of a Wilson osteotomy was described based on these data.

Results: We defined and reproduced the anatomical, mechanical and a proximal joint axis. The angle between the anatomical and mechanical axis showed an average of 6.1° (SD 1.2°). An angle of 85.4 ° (SD 2.8°) between the proximal joint axis and the mechanical axis (metacarpal tilt angle mechanically) and 79.4° (SD 3.1°) for the anatomical axis (metacarpal tilt angle anatomically) was calculated. The proximal joint axis is angulated 9.6° (SD 4.6°) to the middle plane of the metacarpal one. There was no statistically difference between healthy and symptomatic preoperative MC I angles and axes.

A mean angle of 28.7° (SD 5.2°) of correction was found in 6 symptomatic patients. Based on these data an angle of 22.6° (SD 2.5°) 1 cm and 26.7° (SD 2.5°) 1.5 cm above the proximal joint axis has been identified as optimal average correction angle for a Wilsons-osteotomy.

A comparison between the mean values calculated based on 2D and 3D data showed no significant differences.

Conclusion: The correction angle of 20°-30° determined by Wilson could be reproduced with the calculations and explained with the axes of the bone. However, the angle of correction is variable depending on the osteotomy height, bone thickness and angle between the axes. This newly developed method for calculating the angle of correction when

performing a Wilson osteotomy can be used to improve the surgical technique and outcome.

If the axes are defined with small adjustments on a lateral 2D X-ray, similar values can be calculated and a 3D data set is not necessarily required, which is more suitable for a daily clinical routine.

FM46

3D analysis of the thumb after trapeziometacarpal joint surgery

Sophie Charlotte Brackertz¹, Lisa Reissner¹, Gabriella Fischer¹, Maurizio Calcagni¹ (¹*Zürich)*

Osteoarthritis of the trapeziometacarpal joint (TMC) can effectively be treated surgically with Wilson osteotomy (WO), trapeziectomy with ligament reconstruction/tendon interposition (LRTI) and implant arthroplasty (TP). The aim of the study was to record the thumb motion during basic motion and 3 activities of daily living (ADL) in patients following WO, LRTI or TP using infrared cameras. Twenty-nine patients (max. 60 y/o) who had been treated with WO(n=10), TP(n=10) and LRTI(n=9) were recorded with a motion capture system during isolated abduction-adduction, flexion-extension (F/E), opposition and circumduction and three ADLs: opening a jar, bottle and key. Mean follow-up was 23 months (12-66). The patients subjective hand function was assessed with the MHQ. TMC range of motion (ROM) was calculated for each movement trial. Forces during each ADL were measured using a torque force device. Results are reported as median (range) and compared with a Kruskal-Wallis test ($\alpha=0.05$). MHQ was similar in all groups with WO 78, TP 88, LRTI 84. During thumb opposition, TMC F/E ROM was significantly larger after WO (44°, 28-54°) compared to TP (28°, 18-64°, $p=0.038$) and LRTI (30°, 15-41°, $p=0.026$). During circumduction, TMC adduction-abduction ROM was significantly larger after TP (27°, 13-46°) compared to LRTI (15°, 12-28°; $p=0.021$), but not compared to WO (21°, 8-44°). In contrast, during isolated movements in the standard anatomical planes, no statistically significant difference was present. When opening a glass, patients after WO reached 125% of force compared to the contralateral side, after TP 100% and 85% after LRTI. For turning a key TP reached the highest forces. Total MHQ score was indicative of good to very good function, 3 patients indicated a fair function. Patients after LRTI had lower function in pinch force and ROM in basic movements compared with the other two groups. When comparing kinematics of patients after WO and TP during circumduction and opposition, WO allows more TMC movement in the F/E plane

whereas motion in the radial-ulnar plane was larger after TP. These differences were not found during isolated movements in the anatomical planes. Force recordings during ADL compared to the contralateral side was highest in the WO group when opening/closing a jar, TP group reached highest forces in turning a key. For the kinetic parameters, patients after LRTI had the poorest outcome, while WO and TP showed advantages depending on the considered outcome.

FM47

Health-Related Quality-of-Life in Symbrachydactyly: Balancing Function and Appearance.

*Andreas Weber¹, Patrizia Sulser¹, Christopher Gaffney¹, Marco Kaenzig¹, Daniel Weber¹
(¹Zürich)*

Hypothesis: In children with symbrachydactyly, we hypothesized that the highest Pediatric Quality-of-Life Inventory (PedsQL) scores would be found in patients with the most severe forms. Further, we posited that non-significant differences would be observed in assessments of patients' Health-Related Quality-of-Life (HRQoL), appearance, and perceived function compared to their parents.

Methods: In this single-center, observational study, all symbrachydactyly patients treated from 2000 to 2018 were invited to participate. Patients (≥ 3 y) and their parents were asked to complete questionnaires on HRQoL (PedsQL), appearance (ZASH, Zurich Appearance Score for Hands), and function (CHEQ, Children's Hand-use Experience Questionnaire). Patients were assigned to groups based on their ability to grasp. Group A: good grip (unrestricted/slightly impaired grip), Group B: pinch only, Group C: no grip/pinch capability.

Results: We included 58 patients/parents (male 60%; median age 8.5 years [range 3-26]). All symbrachydactyly types were represented and categorized (Group A [n=18; 31%], Group B [n=15; 26%], Group C [n=25; 43%]).

Overall PedsQL scores were high (median 89.1) and similar between genders (M 90.2; F 89.1). Compared to the reference sample, no significant difference between overall scores was detected (95% CI, -0.9 to 4.4; $p=.23$). For the PedsQL subscales, patients consistently rated their perceived function as highest (median 93.8) and emotional sub-scale as lowest (median 87.5). When grouped by hand function, PedsQL scores were lower in Group B (median 85.2) compared to Group A (median 91.3) and Group C (median 92.4).

When comparing patient/parent assessments, parents assessed the emotional sub-scale significantly lower (95% CI, -10 to -2.5; $p=0.01$).

ZASH scores were higher in patients (median 59.5) compared to parents (median 54.0), whereas CHEQ scores were concordant. ZASH scores did not correlate with either the CHEQ or PedsQL, while the CHEQ moderately correlated with PedsQL scores ($r=0.53-0.68$), but only in the parent sample.

Conclusions: Overall, patients with symbrachydactyly and their parents reported consistently high HRQoL scores. Patients without grip capability had the highest PedsQL scores.

The differences in PedsQL scores between parents and patients were similar to those in the reference group. ZASH and CHEQ scores were similar between patients and parents.

Neither hand function nor appearance were found to have appreciable correlations with the PedsQL.

FM48

Management of trapezium's palmar osteophyte in trapeziometacarpal joint osteoarthritis

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Background: Trapeziometacarpal (TMC) joint osteoarthritis is a frequent degenerative pathology encountered in hand surgery. Arthroplasty through a dorsal approach is a routine surgical procedure with satisfactory results, including significant pain reduction and improvement of functional thumb range of motion. However, some patients report persisting post-operative pain on the thenar eminence over the trapezium. It can be explained by an overseen palmar osteophyte of the trapezium, which could not be identified on preoperative plain radiographs nor during the surgical procedure but can only be assessed on a CT scan. To the best of the authors' knowledge, limited studies have evaluated the degenerative aspect of trapezium, and particularly the osteophytic development on the palmar side. Overlapping of carpal bones on plain radiographs does not allow a proper analysis of trapezium osteophytes on its palmar side, resulting sometimes in incomplete surgical treatment. Indeed, this osteophyte can be responsible for persisting pain despite the adequate management of TMC osteoarthritis.

Methods: Starting from 2021, we systematically looked for palmar tenderness over the trapezium during our routine clinical examination of patients suffering from TMC osteoarthritis. If the clinical exam was positive, a complimentary CT was realized to assess the aforementioned osteophyte. When present, we added to our usual surgical procedure for arthroplasty a palmar approach to excise the osteophyte, sometimes using 3D printing of the trapezium for preoperative planning.

Results: Our study involves 12 patients suffering from TMC osteoarthritis with an additional symptomatic palmar osteophyte, clinically suspected and detected on CT scan. The excision of this osteophyte through a palmar approach led to a resolution of the specific palmar pain.

Conclusion: The knowledge of this possible symptomatic palmar osteophyte changed our therapeutic procedure. The standard surgical dorsal approach of the TMC does not allow visualization of the palmar side of the trapezium and consequently the presence of a palmar osteophyte, whose persistence precludes satisfactory postoperative pain evolution. This allowed us to develop a new algorithm for the treatment of TMC joint osteoarthritis. We now systematically include a CT-scan when palmar tenderness is present over the trapezium of a patient suffering from TMC osteoarthritis, allowing the proper treatment to a poorly known source of persisting pain.

FM49 **Collagenase versus limited fasciectomy for Dupuytren's disease – early postoperative implications**

Julia Bernhard¹, Rémy Liechti², Dominique Merky², Ramin Ipakchi¹, Esther Vögelin¹ (¹3010 Bern; ²Bern)

Introduction: Since the withdrawal of the market authorisation of Collagenase clostridium histolyticum (CCH) in Europe in March 2020, the value of this treatment option in Dupuytren's disease became more evident. The aim of this study was to compare outcomes of patients receiving CCH injection with patients undergoing limited fasciectomy (LF) with focus on the early postoperative soft tissue conditions and individual burden measured by the frequency of surgeon and hand therapy visits.

Materials and methods: All consecutive patients undergoing either CCH injection or LF as a first line treatment in a 15 year period (2006-2021) at the University Hospital of Bern, Switzerland were

assessed for eligibility. Propensity score matching involving confounding factors (age, gender, diabetes, family history, disease severity and number of rays involved) was performed to minimize selection bias. Primary outcome analysis was focused on the early postoperative soft tissue condition of the hand using a local wound score with points given for hyperaemia, tenderness and scar mobility. Secondary outcomes included the number of medical and hand therapy visits.

Results: In the mentioned timeframe, 195 patients were treated for Dupuytren's disease at the University hospital of Bern. After exclusion and propensity score matching, two treatment groups of 32 patients each were formed. Mean age was 69.7 years (range 42-85 years) in the CCH group and 70.4 years (range 40-91 years) in the LF group. There were no significant differences in baseline characteristics between treatment groups. Correction of extension deficit was comparable in both treatment groups. Local wound score was significantly worse in the LF group than in the CCH group (mean 0.47 vs. 0.09 points, MD 0.38, 95% CI [0.15, 0.60], p = 0.002). The number of surgeon and hand therapy visits was significantly higher in the LF group (mean 4.7 vs. 1.9 visits, MD 2.8, 95% CI [1.8, 3.8], p < 0.001 and mean 14.6 vs. 4.4 visits, MD 10.2, 95% CI [4.2, 16.1], p = 0.004, respectively).

Conclusion: Evidence of the present study suggests that patients undergoing CCH injection have a significantly less complicated wound healing with softer scar conditions requiring less intensive surgical and hand therapy aftercare. In our opinion, CCH treatment is an important tool in the armamentarium for the treatment of Dupuytren's disease and the reintroduction or approval of a generic drug worthy of being supported.

Gong Show

FM29

Intraoperative findings, treatment option and follow-up in an acute two-level skier's thumb injury

*Alina Strohmaier¹, Mathias Häfeli² (¹Chur;
²Graubünden)*

Introduction: Skier's thumb injuries are frequent sports injuries. Rarely, so-called two-level injuries have been described in the literature, where an osseous lesion and a Stener lesion without attachment of the ulnar collateral ligament (UCL) to the bone fragment occur simultaneously. We report a rare case of an acute two-level skier's thumb injury, intraoperative findings, treatment with anatomic reduction and follow-up results.

Material and methods: A 46-year-old patient presented to our emergency department with pain of the right thumb after a skiing accident. Clinical examination revealed significant ulnar instability. The X-ray showed a dislocated and 90 degrees rotated avulsion fracture of the proximal phalanx base as well as a conspicuous saucer-type small ulnar-sided fragment at the level of the distal first metacarpal bone. In the ultrasound of the first metacarpophalangeal joint we saw an irregularity of the UCL and rupture of the adductor aponeurosis, which was suspicious for a Stener lesion. Because of these findings we indicated surgery. Intraoperatively the UCL was found flipped back at the ruptured aponeurosis with a small bone fragment attached. Incision of the aponeurosis and the capsule, revealed the dislocated and rotated fragment of the proximal phalanx. Refixation of the avulsion fragment and the distal ligament with one bone anchor was performed. The intraoperative X-ray showed an anatomical reduction.

Results: After 4 weeks of immobilization the fracture was mostly consolidated, the joint was stable and the patient pain free. After three months the patient had an equivalent range of motion in both thumbs.

Discussion and conclusion: Compared to other skier's thumb injuries, here it was important to recognize the rotation of the big fracture fragment and to recognize the second smaller fragment in the X-ray. Also the case is a good example that even if ultrasound was not performed perfectly, it led to additional information - the suspicion of a Stener lesion. To recognize these deviations from other skier's thumb injuries, was important to make the

decision to perform surgery. The assumption that the big bone fragment presents the location of the distal part of the ulnar collateral ligament can lead to false treatment decisions. Particularly in frequent cases it's important to stick to an established diagnostic algorithm, be alert of deviations from the typical injury and to be flexible in treatment options according to intraoperative findings.

FM30

Schwannoma of the digital nerve – a rare finding

Carla Kellenberger¹, Mathias Häfeli¹, Christian Wirtz¹, Tim Cordier¹ (¹Chur)

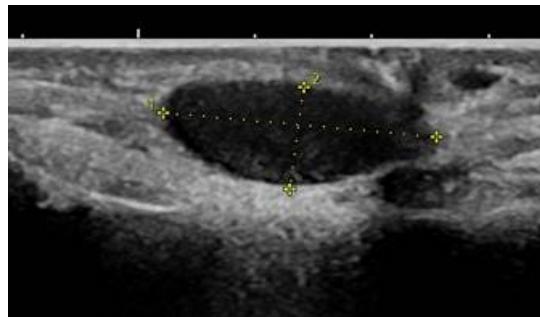
Introduction: Soft-tissue tumors of the hand are common and most often benign. Rare entities should be considered as they can affect surgery and aftercare. We report of a schwannoma of the digital nerve as one reason for soft-tissue swelling in the finger.

Material and Method: A 46-year-old woman presented with a slowly growing mass over the last 3 months at the ulnopalmar side of her ring finger. The mass was painful and progressively compromising the flexion of the finger. There was neither an impairment of capillary refill or sensibility nor a Tinel sign. We palpated a firm, elastic mass, which was mobile to surrounding tissue. Ultrasound showed an 11x4x6mm well defined, rounded, hypoechoic mass in proximity to the ulnopalmar digital artery without any Doppler flow. The ulnopalmar digital nerve was not clearly identifiable.

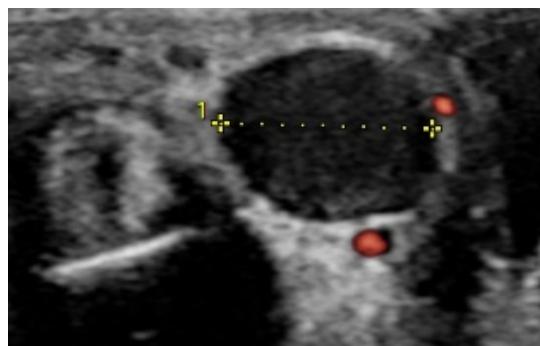
Result: During Surgery, we identified the ulnopalmar neuro-vascular bundle. The tumor presented as an elliptic, beige mass, incorporated in the digital nerve's sheath and was bluntly separated from the nerve fascicles. Histologic results confirmed the diagnosis of a schwannoma. After 4 weeks, the patient was pain-free with a good range of motion. There was a painless Tinel sign over the digital nerve with normal sensibility.

Discussion: A schwannoma is a benign tumor growing from Schwann cells and with about 90% the most common peripheral nerve tumor (Pertea2022). Usually growing slowly and eccentrically in the peripheral nerve sheath it can remain asymptomatic until it causes functional deficit or pain. To define the relationship to adjacent structures diagnostic imaging is helpful. MRI can differ between a malignant and benign lesion but cannot distinguish a schwannoma from a neurofibroma. Ultrasound shows a well-defined,

fusiform, hypoechoic mass with loss of fascicular patterns. Final diagnosis can only be made histologically. Only few cases of occurrence in the hand were reported so far. Still, it should be considered as a differential diagnosis of neoplasms such as ganglion cyst, giant cell tumor, lipoma or neurofibroma. If symptomatic, surgical excision is advised.



Schwannom Ultraschall sagittal



Schwannom Ultraschall axial



Schwannom intraoperativ

FM31 Chronic Finger Joint Luxation; Having A Go With The “MiniFlo”

Andrej Cousin¹, Dominique Merky¹, Esther Vögelin¹, Nadja Grob¹ (¹Bern)

Introduction: Chronic luxation of a finger joint, either the metacarpophalangeal (MCP) or proximal interphalangeal phalanx (PIP) joint, can be challenging to treat. After open reduction and

arthrolysis, relaxation or impaired range of motion (ROM) are often observed. We think the key of success lies in postoperative immediate guided, controlled passive motion of the involved joint. With the use of the MiniFlo™ (Citieffe, Bologna, Italy), an external distraction device, successful management may be achieved.

Method: We report two cases of chronic MCP V respectively PIP II joint luxation. In both cases, initial reduction through a dorsal and palmar (MCP) respectively palmar incision (PIP) was unsuccessful, with relaxation and impaired ROM after surgery. In a second attempt six months, respectively four months later, an arthrolysis and reposition of the chronically dislocated joints in combination with installation of the external fixateur MiniFlo, to start with immediate postoperative controlled passive motion for 4-8 weeks, was performed. Because of relaxation, pain and joint stiffness, the only alternative would have been an arthrodesis.

Results: On average, a joint motion from 0° pre-operatively to about 90° ROM could be documented about two to three months after dismantling the MiniFlo. During the follow up time, eight to twelve months after the second surgery, no relaxation or subluxation in either case was observed and ROM could be maintained. So far, no “third” surgery for arthroplasty because of joint-pain was necessary.

Conclusion: An early controlled, passive joint motion, managed with the “MiniFlo”, instead of a postoperative immobilization phase, is a promising therapy extension in chronic finger joint luxation. Especially if arthrodesis would be the only other option to treat rigid, painful, degenerative joint arthritis. Pre-requisite is a motivated and compliant patient.

FM32

One year results and comparison of two double mobility prostheses for trapeziometacarpal arthritis

Eva Winand¹, Moritz Scholtes¹, Sebastian Hediger¹ (¹Frauenfeld)

Objective: To analyse our short term clinical and radiographic results for double mobility prostheses for trapeziometacarpal arthritis using two different implant systems and hence also focusing on possible differences between the two systems.

Methods: Patients treated with a double mobility implant for trapeziometacarpal arthritis were prospectively included in a registry since February

2021. The implant type used was either MAÏA™, or TOUCH®, depended on the location where the operation was performed (our clinic performs operations equally at two locations). We recorded data preoperatively, at 6 weeks, 3 months and 1 year. Patient reported outcome was assessed using the bMHQ. Pain was rated at rest and during daily activities. Key pinch strength and thumb mobility using the Kapandji score was measured. In the radiographic assessment we focused on cup position (i.e. eccentricity – defined as the cup breaching or touching the cortex of the trapezium) and in the short term on signs of cup loosening. Further, we recorded complications and revisions.

Results: Until submission of the abstract, we have 47 implants in our registry, of whom 25 were operated on 1 year ago or earlier and were therefore considered in this analysis. No revisions had to be performed so far, resulting in a survival rate of 100%. As the sole complication, we encountered one case of De Quervain's tenosynovitis. This case was treated with additional surgery. At one year, 19 patients were available for follow-up (8 MAÏA™, 11 TOUCH®). Overall, the bMHQ score increased from mean 45.9 (CI: 42.2-49.5) preoperatively to 85 (CI: 82.4-89.4). Pain at rest/ during daily activities decreased from 8 (CI: 7.7-8.3)/ 8 (CI: 7.7-8.3) to 0.15 (CI: 0.01-0.29)/ 0.4 (CI: 0.2-1.11). Key pinch strength increased from 4.2kg (CI: 3.6-4.8) to 5kg (CI: 4.6-5.4). Thumb mobility showed a slight improvement. No significant difference in the respective results between the two implants could be detected. Radiological analysis showed no case of cup loosening until final follow up. Eccentric cup position occurred in four cases (equally allotted between the two implants) but without detectable implications on clinical outcome.

Conclusions: Our results, despite a small patient number, using two double mobility implants for treating trapeziometacarpal arthritis are very promising and comparable to the current literature. No detectable difference in the clinical or radiological analysis between the two implants could be documented.

FM33

To amputate or not? Extreme digital salvage after resection of a recurrent giant cell tumor

Crinu Baesu¹, Jan Plock¹, Florian Früh¹ (¹Aarau)

Abstract: Giant cell tumors of tendon sheath (GCTTS), also known as pigmented villonodular tenosynovitis, are the second most common soft tissue tumors after ganglion cysts. They can be

divided into masses with localized or diffuse growth pattern. We herein report a case of a GCTTS recurrence in a 54-year-old male patient.

The patient suffered from a left middle finger GCTTS recurrence. Radiographs and magnetic resonance (MR) imaging revealed involvement of the ulnar neurovascular bundle, the flexor and extensor tendons as well as a destruction of the distal interphalangeal (DIP) joint. The patient was an active sportsman and wished for digital preservation. Hence, radical excision with en-bloc resection of the DIP joint was performed, resulting in a sub-circumferential 4x3 cm defect. The joint was fused using a cannulated compression screw and the soft tissue defect was reconstructed with a retrograde-arterialized free venous flap from the ipsilateral forearm. One arterialized inflow vein and two outflow veins (1 dorsal and 1 palmar) were included in the flap. The further clinical course was uneventful with no radiographic or MR signs of recurrence at 6-months. Histopathology revealed a GCTTS without signs of malignant transformation. At 4 months after surgery, the patient was able to return to all previous recreational activities.

Recurrent and infiltrative GCTTS in fingers are a challenging clinical problem. In our case, the patient opted for digital preservation with microvascular tissue transfer. Free venous flaps are an excellent reconstructive option for extensive digital defects because they can be tailored to almost any defect geometry. Furthermore, depending on the forearm anatomy, they can also serve for concomitant digital nerve reconstruction using terminal branches of the lateral or medial antebrachial cutaneous nerves. However, amputation should always be discussed with patients suffering from massive GCTTS recurrence. Compared with potentially complicated microvascular reconstruction, digital amputation offers a faster treatment with a lower risk for long-term complications.

Taken together, massive distal digital defects associated with GCTTS recurrence are a reconstructive challenge. Free venous flaps are an excellent option for digital salvage in these cases.

FM34

Disseminated Nocardia Paucivorans Infection with ulnocarpal lesions, pulmonary and CNS involvement

Peter Mohos¹ (¹Bruderholzspital)

Introduction: Most *Nocardia* infections have been identified after inhalation in immunocompromised

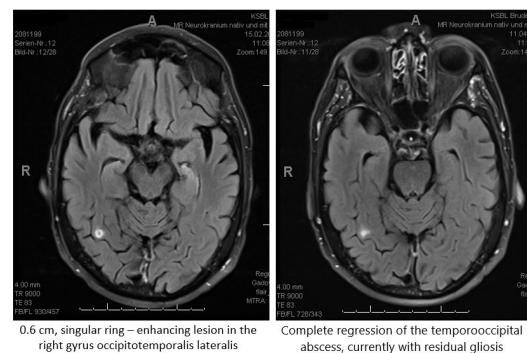
hosts, including patients with HIV infection, persons taking immunosuppression after transplantation, or those receiving chemotherapy for malignancy. In rare cases, immunocompetent patients can develop a cutaneous form of Nocardia infection after a traumatic percutaneous inoculum. In disseminated disease, the lungs, brain, and skin are most commonly affected.

Case: We describe a 64-year-old immunocompromised man undergoing chemotherapy for hepatic and pulmonary metastatic adenocarcinoma, who presented with an atraumatic, infectious forearm lesion, which was surgically debrided. Co-amoxicillin was empirically started. The microbiological report detect *Nocardia paucivorans*, so that the imaging diagnostics with PET CT and skull MRI were completed. They could describe the primary pleural focus, as well as the presence of a cerebral nocardial abscess. After identification of the cerebral and pulmonary lesions, we started an intravenously antibiotic therapy with Ceftriaxon and Amikacin immediately. The control - MRI of the skull showed a complete regression after 6 weeks, so that the antibiotic therapy could be switched to peroral Minocycline and Moxifloxacin.

Discussion: Due to its rarity and the unspecific clinical picture, nocardiosis is often misdiagnosed and has a high mortality rate especially in immunosuppressed patients. On the other hand, these bacteria are very difficult to identify in culture, which delays the diagnosis. In some cases, it require 2-4 weeks until the colonies appear. In our case, the germ was identified only nine days after the patient presented in our hospital.

To our knowledge, no disseminated *Nocardia* infection, presenting with subcutaneous lesion as a single sign of this disseminated disease has been until now reported. During the clinical examination on the emergency department, there was no suspicion of either pulmonary or cerebral involvement.

When patients present with unfamiliar, atraumatic skin lesions, it is important to think of *Nocardia* infection as possible pathogens, especially among risk groups such as immunocompromised patients.



Nocardia CNS involvement before and after adjustment of the antibiotic therapy,

FM35

Exceptional Manifestation Of Synovial Chondromatosis In A Small Finger - A Case Report

Léonie Hüsler¹, Alain Schiffmann¹, Urs Hug¹
^(Luzern)

Introduction: Synovial chondromatosis is a rare benign disorder. It is characterized by the metaplasia and proliferation of synovial tissue, resulting in the formation of loose cartilaginous or osteocartilaginous bodies within the synovial membrane of joints. It predominantly affects large joints, while its occurrence in small joints, such as finger joints, is uncommon. The malignant degeneration into chondrosarcoma has been described but is rare. The typical radiographic presentation of synovial chondromatosis is characterized by multiple calcified cartilaginous loose bodies. In advanced stages, it may progress to the formation of a giant solitary synovial chondromatosis through the fusion of the loose cartilaginous bodies. This case report presents an interesting case of synovial chondromatosis, highlighting the clinical manifestations with significant functional impairments and the successful treatment outcome.

Material & Methods: A comprehensive work-up of the patient's medical records, including history, examination findings, radiographic imaging, and surgical intervention, was performed.

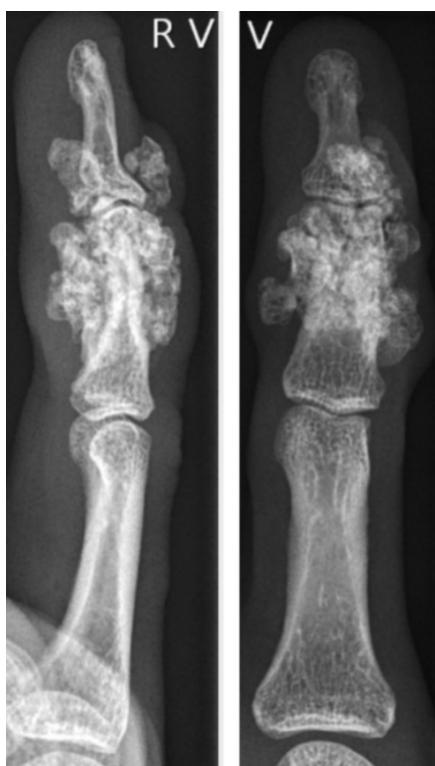
Results: The case report describes a 40-year-old male cook who presented with a progressive swelling of the distal interphalangeal joint of the small finger, persisting for 15 years. The swelling was indolent but hindered the patient's ability to grip knives properly due to restricted mobility. The patient's inability to use the non-functional finger in daily activities led to a strong desire for amputation. Although joint disarticulation was considered as a therapeutic option, the patient

ultimately underwent tumor resection, which included extensor and flexor tendon tenolysis. Remarkably, the patient achieved a full restoration of range of motion and became completely symptom-free.

Conclusion: By presenting this exceptional case report, it serves as a reminder to hand surgeons about the potential involvement of smaller joints, such as the distal interphalangeal joint, in synovial chondromatosis.



Digitus V



x-ray

FM36 Die Sattelgelenksprothese als Therapieoption bei Metakarpale-I-Trümmerfrakturen

Stephanie Luz¹, Johannes Fuchs¹, Jörg Hainich¹, Dominik Spühler¹ (Kantonsspital St. Gallen)

Einleitung: Die Behandlung intraartikulärer Trümmerfrakturen der Metakarpale-I-Basis ist anspruchsvoll und zeigt nach konventioneller Frakturversorgung häufig unbefriedigende Ergebnisse bei nicht anatomisch wiederherstellbarer Gelenkfläche mit Ausbildung einer sekundären Arthrose.

Im Bereich der elektiven Behandlung der Osteoarthritis des Daumensattelgelenks zeigt die CMC-1 Prothese zuverlässige, sehr gute mittel- und inzwischen auch langfristige Ergebnisse. Die Verwendung derselben als Frakturprothese bietet sich als Rückzugsmöglichkeit in komplexen Fällen an. Hierzu finden sich in der Literatur bis dato keine Fallberichte.

Wir präsentieren den ersten Fall einer CMC-1-Prothesenimplantation bei intraartikulärer, dislozierter, mehrfragmentärer Metakarpale-I-Basisfraktur als alternative Frakturversorgung bei einer rüstigen, betagten Patientin.

Ergebnisse: Im postoperativen follow up kann eine vollständige Schmerzfreiheit bei vollständig freier Beweglichkeit des linken Daumens mit Wiederherstellung der Selbständigkeit im Alltag erreicht werden.

Zusammenfassung: Die primäre Implantation einer Daumensattelgelenksprothese bei nicht anatomisch rekonstruierbaren Trümmer- oder Defektfrakturen der Metakarpale-I-Basis ist eine technisch einfach umsetzbare Rückzugsmöglichkeit und kann als Alternative zur herkömmlichen Frakturversorgung dienen. Postoperativer Verlauf und Outcome unterscheiden sich nicht von der Implantation bei Rhizarthrose.

Zur Evaluation der indizierten Frakturtypen, dem geeigneten Patientenalter sowie dem langfristigen Outcome ist eine randomisierte, prospektive Studie in unserem Haus geplant.

FM37

Diagnostic accuracy of wrist MRI in comparison to wrist arthroscopy regarding TFCC lesions

Christian Spies¹, Frank Unglaub² (¹Langenthal; ²Bad Rappenau DE)

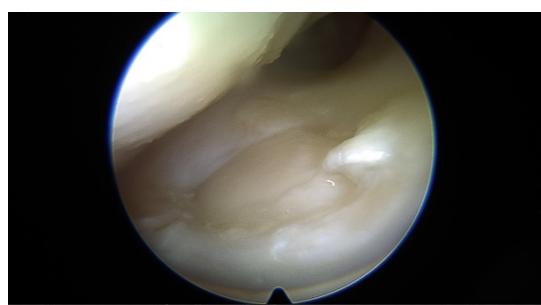
Introduction: The purpose of this study was to arthroscopically verify MRI diagnostic accuracy for triangular fibrocartilage complex (TFCC) lesions in a regular clinical environment.

Methods: A total of 859 patients' data with both preoperative MRI of the wrist and additional wrist arthroscopy were retrospectively reviewed. Two board-certified hand surgeons and one orthopaedic surgeon executed wrist arthroscopy, whereas more than 100 radiologists examined the MRI of the wrist. The accordance of TFCC lesion classification using MRI in comparison to wrist arthroscopy and diagnostic precision of the former depending on technical details were evaluated.

Results: Diagnostic accuracy of MRI for TFCC lesions is poor in comparison to wrist arthroscopy as the reference standard. Technical specifications for MRI of the wrist are heterogeneous among the radiologists. These parameters have not improved accuracy of TFCC evaluation at large.

Conclusion: The accuracy of MRI in a regular clinical environment still remains inferior to wrist arthroscopy for detection of TFCC lesions.

Development of a standard MRI protocol may be implemented on a regular basis and application of the Palmer classification for TFCC lesion should be sought.



TFCC 2C lesion.jpg

FM38

High-intensity focused ultrasound therapy for an osteoidosteoma in a pediatric finger: a case report

Joëlle V. Hüppi¹, Christoph Andreas Binkert¹, Nadja Zechmann-Müller¹ (¹Winterthur)

Introduction: High intensity focused ultrasound (HIFU) is a potential non-ionizing and non-invasive application for benign and malignant disease. Ultrasonic waves are concentrated in a specific manner to achieve high level of energy in specific area of tissue. This leads to an increase of temperature and to necrosis due to coagulation resulting in irreversible damage of the tissue. We will describe one pediatric case where HIFU was successful in the treatment of an osteoidosteoma.

Material and Methods: A seven-year-old boy presented in our department for hand surgery due to notable indolent swelling of the distal phalanx of the right ring finger. Neither recent trauma, nor any history of rheumatological disease in family history was memorable. Clinical examination showed significant enlargement of the distal phalanx with minimal pain on palpation and unlimited mobility. Conventional radiography showed discrete fuzzy sclerosis of the metaphyseal part of the growth plate. MRI was not conclusive, but suspicious for chronic osteomyelitis. Bone biopsy showed reactive change with no signs for acute inflammatory event. Periodic checks were performed, with no change in clinical and radiographic aspect. Nine months after the first appointment, the patient presented with pain after minor trauma and increase of the swelling. Radiography showed a visible light spot, so called nidus, in the distal phalanx leading to a suspected diagnosis of an osteoidosteoma. In a synopsis of the present findings, MRI-guided HIFU (MR-HIFU) was recommended.

Results: One year after the first appointment, MR-HIFU was performed to destroy the nidus of the osteoidosteoma and to prevent further hypertrophic growth. Six months after the intervention the patient presented with no further exponential growth and the difference to the other phalanges was minimized. Furthermore, radiography showed no retention of the nidus with a plane distal phalanx.

Discussion: MR-HIFU is a promising approach in the non-invasive treatment of tumorous neoplasm. Because of its non-ionizing ultrasonic waves, there is no upper limit in dosing. The deposition of heat is in general limited by the surrounding tissue, which should not be exposed to overheating. The main factors preventing MR-HIFU treatment are thick bone around the nidus, a superficial position with risk for skin burn and the vicinity to neural structures. Osteoidosteomas are generally rather small and therefore well suited for MR-HIFU.

A case of destructive osteoarticular tuberculosis of the thumb interphalangeal (IP) joint

Xavier Beaud¹, Thomas Meszaros¹, Nina Fuchs¹
¹Villars-sur-Glâne)

About a quarter of the world's population is latent infected with *Mycobacterium tuberculosis*. In Switzerland, the incidence remains very low, especially in the native population. Digital localization is uncommon, representing 4-8% of cases of osteoarticular tuberculosis.

Method: We report the case of a 49-year-old bricklayer of southwestern European origin, who showed a painful atraumatic swelling of the IP joint of his right thumb for several weeks, without improvement after an empirical antibiotic treatment and an incision for drainage of a suspicious panaritium. Synovial hypertrophy but no frank effusion was found sonographically, an osteopenia and narrowing of the IP joint space on conventional radiographs. The appearance of a dorsal fistula about one month after the initial presentation raised the suspicion of chronic septic arthritis. A debridement with sampling for microbiological and histopathological analysis was performed. Conventional microbiological analysis revealed no bacterial growth, but the histopathology severe chronic granulomatous synovitis and partially necrotic osteomyelitis. The diagnosis of *Mycobacterium tuberculosis* osteoarthritis was confirmed by subsequent PCR analysis. Systemic evaluation revealed associated pulmonary tuberculosis, and antibiotic treatment was initiated. After an initial positive postoperative period, the IP joint remained symptomatic at three months, with localized pain, decreased range of motion, and progressive destruction on conventional radiograph. A second debridement with sampling was performed and the joint was fused with Kirschner wires. No bacterial growth, residual granulomatous inflammation, or giant cells were identified in the intraoperative samples. The local pain decreased rapidly. At the last follow-up before abstract submission (11 weeks), the arthrodesis was not completely healed, and immobilisation with a splint was continued.

Conclusion: Even if it remains very rare in developed countries, tuberculosis should be considered as a differential diagnosis in cases with atypical presentation of digital osteoarthritis. Although the literature on tuberculous interphalangeal osteoarthritis is sparse, its treatment appears to be primarily medicamentous. Surgery is

initially needed as diagnostic tool and sometimes to treat symptomatic sequelae in the later course of the disease. As treatment for symptomatic destruction of the interphalangeal joint of the thumb, arthrodesis appears to be a valuable option.



initial presentation.jpg



before 2nd look and arthrodesis.png



6 weeks postoperative.JPG

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FM60

Ist propriozeptive Rehabilitation bei Handgelenkssteifheit nach der Operation hilfreich?

Charlotte Soete¹ (¹Neuchâtel)

Distalradiusfrakturen (DRF) sind bei Erwachsenen häufig und machen etwa 17,5% aller Frakturen aus¹. Die Rehabilitation stellt den Therapeuten vor die Herausforderung, einerseits die Schmerzen zu reduzieren und andererseits die Beweglichkeit, Kraft und Funktion zu verbessern. Komplikationen kommen dabei oft vor und werden in 27% der Fälle von Ärzten gemeldet (basierend auf Diagnosen) und in 21% von Patienten (basierend auf Symptomatik)².

Bei DRF, die mit Osteosynthese behandelt wurden, sind Gelenksteife und an verschiedenen Stellen des Handgelenks lokalisierte Schmerzen auch nach drei Monaten postoperativ nicht ungewöhnlich. Mehrere Literaturrecherchen zur Behandlung dieser komplexen Fälle nach der Operation ergaben keine Informationen über die Behandlung.

In einigen Artikeln und Büchern wird die Rehabilitation der bewussten und unbewussten Propriozeption für die Rehabilitation nach DRF diskutiert. Es handelt sich hierbei um ein weniger bekanntes Vorgehen, das für Handtherapeuten nicht einfach umzusetzen ist³. Könnte das von Mesplié⁴ übernommene Hagert-Programm helfen, bei einem steifen Handgelenk mehr als drei Monate nach der Operation den Bewegungsradius und die Funktionalität zu verbessern? Die Anwendung dieses Programms in zwei klinischen Fällen soll hier vorgestellt und die Implikationen für die Praxis diskutiert werden.

La rééducation proprioceptive: bénéfique sur des raideurs de poignet à distance de l'opération?

Charlotte Soete¹ (¹Neuchâtel)

Les fractures de l'extrémité distale du radius (EDR) sont fréquentes chez l'adulte et représentent environ 17,5% de toutes les fractures¹. La rééducation

constitue un défi pour le thérapeute en termes de réduction des douleurs, d'amélioration de la mobilité, de la force et de la fonction. Les complications liées à ces fractures sont fréquentes: 27% rapportées par les médecins (basé sur les diagnostics) et 21% rapportées par les patients (basé sur la symptomatologie)².

Dans les cas de fractures EDR traitée par ostéosynthèse, il n'est pas rare de retrouver des raideurs articulaires et des douleurs localisées à différents endroits au niveau du poignet au-delà des 3 mois post-opératoire. Diverses recherches effectuées dans la littérature sur le traitement de ces cas complexes à distance de l'opération ne fournissent pas d'information sur la prise en charge.

Plusieurs articles et livres parlent de la rééducation de la proprioception consciente et inconsciente pour la rééducation post-fracture EDR. Ce thème est moins bien connu et n'est pas évident à mettre en pratique pour les thérapeutes de la main³. Le programme de Hagert, repris par Mesplié⁴ aiderait-il à gagner en amplitudes actives et fonction sur un poignet raide à plus de 3 mois post opératoire ? Présentation de deux cas cliniques de l'application de ce programme et implication pour la pratique.

¹Nellans, K. W., Kowalski, E., & Chung, K. C. (2012). The Epidemiology of Distal Radius Fractures. *Hand Clinics*, 28(2), 113-125. <https://doi.org/10.1016/j.hcl.2012.02.001>

²McKay, S. D., MacDermid, J. C., Roth, J. H., & Richards, R. S. (2001). Assessment of complications of distal radius fractures and development of a complication checklist. *The Journal of Hand Surgery*, 26(5), 916-922. <https://doi.org/10.1053/jhsu.2001.26662>

³Hagert, E. (2010). Proprioception of the Wrist Joint : A Review of Current Concepts and Possible Implications on the Rehabilitation of the Wrist. *Journal of Hand Therapy*, 23(1), 2-17. <https://doi.org/10.1016/j.jht.2009.09.008>

⁴Grégory Mesplié, Josette Mesplié - Thérapie de la main : Anatomie fonctionnelle et thérapie des pathologies du poignet. (s. d.). Consulté 30 avril 2023, à l'adresse <https://www.sauramps.com/product/49160/gregory-mesplie-josette-mesplie-therapie-de-la-main-anatomie-fonctionnelle-et-therapie-des-pathologies-du-poignet>

FM61 **Motorische Kontrolle und motorisches Lernen in der Handtherapie**

Vera Beckmann-Fries¹, Céline Schneider¹
(¹Zürich)

Hintergrund: In der Handtherapie werden die Prinzipien der motorischen Kontrolle und des motorischen Lernens intuitiv angewendet. Es ist jedoch sinnvoll, diese bewusst zu reflektieren und in die Therapie einzubeziehen. Nach einer Verletzung oder bei degenerativen Veränderungen müssen Bewegungen neu wahrgenommen, erlernt oder adaptiert werden, um letztendlich die volle Funktion der oberen Extremität: das Greifen, Manipulieren und Stützen, wieder durchführen zu können.

«Motorische Kontrolle bezieht sich auf den Prozess, mit dem das zentrale Nervensystem Bewegungen des Körpers plant, koordiniert und ausführt.»¹⁾ Die motorische Kontrolle umfasst die Steuerung der Muskulatur und die Kontrolle von Gelenksbewegungen, um koordinierte und funktionelle Bewegungen zu ermöglichen. Sensorische Inputs und Wahrnehmung helfen, eine Bewegung auszuwählen und zu steuern. Die motorische Kontrolle spielt eine wesentliche Rolle in alltäglichen Aktivitäten, wie Gehen, Greifen von Gegenständen, Sportausübung und anderen Bewegungsabläufen.

«Die Grundprinzipien des Motorischen Lernens können auf verschiedene Weise formuliert werden, aber im Allgemeinen beziehen sie sich auf die grundlegenden Konzepte, die das Lernen von motorischen Fähigkeiten steuern und beeinflussen.»¹⁾ Wiederholungen und Übungen sind Schlüsselkomponenten, wenn es darum geht, Bewegungen (neu) zu erlernen. Feedback spielt hierbei eine wichtige Rolle, da es hilft, die Leistung zu bewerten und Anpassungen vorzunehmen. Fehler machen gehört dazu, und Korrekturen können umgesetzt werden. Zudem ist es hilfreich, Bewegungen und Aktivitäten in unterschiedlichen Umgebungen auszuführen. Dies führt zur Kontextualisierung, also der Art und Weise, wie eine Bewegung in welcher Umgebung und welchem Ziel ausgeführt wird.

Ziel/Implikation: Die Grundlagen der motorischen Kontrolle und des motorischen Lernens werden vorgestellt und anhand praktischer Beispiele aus der Praxis erläutert.

Contrôle et apprentissage moteurs en rééducation de la main

Vera Beckmann-Fries¹, Céline Schneider¹
(¹Zurich)

Contexte : les principes du contrôle et de l'apprentissage moteurs sont intuitivement mis en place en rééducation de la main. Il est toutefois judicieux d'y réfléchir consciemment et de les intégrer dans la thérapie. Après une blessure ou lors d'une atteinte dégénérative, les mouvements doivent être perçus, appris ou adaptés de manière différente, afin de rétablir la fonction complète du membre supérieur en termes de préhensions, de manipulations et de soutien.

« Le contrôle moteur fait référence au processus permettant au système nerveux central de planifier, coordonner et exécuter les mouvements du corps. »
1) Le contrôle moteur englobe le contrôle des muscles et le contrôle des mouvements articulaires afin de permettre des mouvements coordonnés et fonctionnels. Les inputs sensoriels et la perception aident à sélectionner et à contrôler un mouvement. Le contrôle moteur joue un rôle essentiel dans les activités quotidiennes telles que la marche, la préhension d'objets, la pratique d'un sport et d'autres séquences de mouvements.

« Les principes fondamentaux de l'apprentissage moteur peuvent être formulés de différentes façons mais, de manière générale, se réfèrent aux concepts de base qui guident et influencent l'apprentissage des capacités motrices. »
1) Les répétitions et les exercices sont des composantes clés quand il s'agit de (ré)apprendre des mouvements. Le feedback joue dans ce contexte un rôle important car il permet d'évaluer les performances et de procéder à des ajustements. Committre des erreurs fait partie du processus et des adaptations peuvent être mises en œuvre. De plus, il est utile de réaliser des mouvements et des activités dans des environnements différents. Cela mène à la contextualisation, c'est-à-dire à la manière dont un mouvement est exécuté, selon l'environnement et le but.

Objectif/implication : les bases du contrôle et de l'apprentissage moteurs seront présentées et expliquées à l'aide d'exemples tirés de la pratique.

1)OpenAI's ChatGPT AI language model,
communication personnelle, 18.05.2023

FM62

Behandlung von Allodynien der oberen Extremität durch die Anwendung von Pyonex-Nadeln (PN)

Céline Thuler¹ (¹Neuchâtel)

Einleitung: Bei der Rehabilitation der oberen Extremität begegnen wir häufig Patienten, die aufgrund von Nervenverletzungen an mechanischer Allodynie leiden. Die Anwendung von PN in der Peripherie des allodynischen Bereichs erschien uns als Behandlungsansatz, den es näher zu beleuchten gilt. Es handelt sich um eine einfache, kostengünstige und für den Patienten wenig belastende Behandlung. Ziel der Studie ist es, die Wirkung der oberflächliche Afferenzstimulation (Superficial Dry Needling) bei der Behandlung von Allodynien im Bereich der oberen Extremität unter Verwendung von NP als therapeutisches Mittel zu untersuchen.

Methode: Die Einzelfallanalyse wurde unter Anwendung der Single-Case-Experimental-Design-Methode durchgeführt. Wiederholte Messungen wurden im Doppelblindverfahren über 12 Wochen während 3 "ABA"-Phasen vorgenommen, wobei die Baseline (A) 3 Wochen und die Behandlung (B) 6 Wochen dauerten. Die Einschlusskriterien waren, dass der Patient seit mindestens 6 Monaten an Allodynie in der oberen Extremität leidet und dem Begutachter sowie dem Therapeuten vor Beginn der Studie unbekannt ist. Als primäre Messgrösse wählten wir die Allodynographie zusammen mit der Regenbogen-Schmerzskala und als sekundäre Messgrösse die Schmerzeinschätzung.

Ergebnis: Die Ergebnisse belegen, dass die Behandlung mit PN die Grösse des allodynischen Bereichs in diesem einzelnen Studienfall verringert. Der allodynische Bereich war zu Beginn der Studie 296cm² und nach 12 Wochen 170cm² gross, was einer Abnahme um 43% entspricht. Der Bereich der Regenbogen-Schmerzskala betrug 169cm² und ging auf 57cm² zurück, hat also um 66% abgenommen. Wir beobachten auch eine Stabilisierung der Allodynographie zum Zeitpunkt der Beendigung der Nadelbehandlung, sodass wir zum Schluss kommen, dass die Anwendung der Nadeln tatsächlich eine Wirkung hatte. Die Entwicklung der Schmerzen ist weniger eindeutig, es ist keine Korrelation zwischen der Schmerzintensität, der Aufnahme der Behandlung und deren Beendigung zu beobachten.

Schlussfolgerung: Diese Studie zeigt ein potenzielles Forschungsfeld auf und validiert einen möglichen neuen therapeutischen Ansatz zur

Behandlung von statischen mechanischen Allodynien. Durch Studien in grösserem Massstab könnte die Beweiswirkung noch gesteigert werden. Wir könnten uns auch andere Anwendungsgebiete vorstellen, z.B. in Bereichen, die sich im proximalen Teil des kutanen Verteilungsgebiets des geschädigten Nervenastes befinden.

FM62

Traitemet des allodynies du membre supérieur par l'application d'Aiguilles Punaises Pyonex (APP)

Céline Thuler¹ (¹Neuchâtel)

Introduction : Lors des prises en charge en rééducation du membre supérieur, nous rencontrons fréquemment des patients souffrant d'allodynie mécanique suite à des lésions nerveuses. L'application des APP en périphérie du territoire allodynique nous a semblé une approche thérapeutique à explorer. C'est un traitement simple, peu coûteux et peu contraignant pour le patient. Le but de l'étude est de déterminer les effets provoqués par la stimulation superficielle des afférences (Dry Needling Superficiel) dans le traitement des allodynies au niveau du membre supérieur, en utilisant les APP comme agent thérapeutique.

Méthode : L'analyse d'un cas unique a été menée en appliquant la méthode Single Case Experimental Design. Des mesures répétées ont été effectuées en double aveugle pendant 12 semaines, durant 3 phases « ABA », la ligne de base (A) 3 semaines et le traitement (B) 6 semaines. Les critères d'inclusions étaient un patient souffrant d'une allodynie depuis 6 mois au moins, au niveau du membre supérieur et inconnu de l'évaluateur ainsi que du thérapeute avant le commencement de l'étude. Nous avons choisi comme mesure principale l'allodynographie et le territoire de l'arc-en-ciel et comme mesure secondaire l'évaluation de la douleur.

Résultat : Les résultats attestent que le traitement par des APP réduit la taille de la zone allodynique pour ce cas d'étude unique. L'allodynographie était de 296cm² au début de l'étude et de 170cm² après 12 semaines ce qui correspond à une diminution de 43%. Le territoire de l'arc-en-ciel était de 169cm² et a régressé à 57cm², cela représente une diminution de 66%. Nous observons également une stabilisation de l'allodynographie au moment de l'arrêt de la pose des APP, ce qui nous pousse à conclure au réel impact de l'application des punaises. L'évolution de la douleur est moins évidente, aucune corrélation entre l'intensité des

douleurs, l'introduction du traitement et son arrêt n'est observable.

Conclusion : Cette étude démontre un potentiel terrain de recherche et valide un éventuel nouvel agent thérapeutique pour traiter les allodynies mécaniques statiques. Des études à plus grande échelle permettraient d'augmenter l'effet de preuves. Nous pourrions également imaginer d'autres zones d'applications, par exemple, dans les zones de travail se situant sur la partie proximale du territoire de distribution cutanée de la branche nerveuse lésée.

FM63

Kinesiophobie, zu beachten in der Handtherapie? Eine Annäherung

Nadine Schulz¹, Vera Beckmann-Fries¹ (¹Zürich)

Hintergrund: Die Entstehung der Kinesiophobie, also der Angst vor körperlicher Bewegung, ist komplex und tritt bei einer Vielzahl von Personen mit unterschiedlichen muskuloskelettalen Erkrankungen oder einer Vorgesichte von Operationen auf (Huang et al., 2022). In Ihrer Arbeit zeigten Pagels et al. (2022) auf, dass Kinesiophobie bei Schulterbeschwerden beispielsweise einen negativen Einfluss auf den Therapieerfolg hat. Ähnliche Ergebnisse wurden auch von Tuna & Oksay (2018) erzielt, die Patienten nach einer Sehnenoperation an der Hand untersuchten und feststellten, dass Patienten mit stärkerer Kinesiophobie schlechtere funktionelle Resultate erzielten als Patienten mit geringerer Kinesiophobie. Trotz dieser Erkenntnisse finden sich nur wenige Studien, die sich mit der Kinesiophobie im Zusammenhang mit Handtherapie, Handverletzungen und -erkrankungen befassen.

Ziel/implikation: Das Ziel dieser Literaturarbeit besteht darin, einen aktuellen Überblick über das Thema Kinesiophobie in der Handtherapie zu geben, offene Fragen zu identifizieren und zu untersuchen, ob es spezifische praxisbezogene Ansätze gibt. Darüber hinaus soll aufgezeigt werden, wie Kinesiophobie erfasst und gemessen werden kann und ob vorhandene Befundinstrumente auch für die Handtherapie reliabel und valabel sind.

Methode: Literaturrecherche in Datenbanken wie PubMed, Cinahl, MedLine, sowie Fachbücher

Resultate: Resultate und daraus resultierende Erkenntnisse werden am Kongress vorgestellt.

Kinésiophobie, à prendre en compte en thérapie de la main ? Présentation d'une approche possible

Nadine Schulz¹, Vera Beckmann-Fries¹ (¹Zurich)

Contexte: L'origine de la kinésiophobie, c'est-à-dire la peur de l'activité physique, est complexe et se manifeste chez un grand nombre de personnes souffrant de différentes maladies musculo-squelettiques ou ayant des antécédents chirurgicaux (Huang et al., 2022). Dans leur travail, Pagels et al. (2022) ont démontré que la kinésiophobie avait par exemple une influence négative sur le succès thérapeutique en cas de douleurs à l'épaule. Des résultats similaires ont également été obtenus par Tuna & Oksay (2018) qui ont examiné des personnes ayant subi une opération des tendons de la main et ont constaté que les patients présentant une kinésiophobie plus importante obtenaient de moins bons résultats fonctionnels que les patients ayant une kinésiophobie moindre. Malgré ces constatations, il n'y a que peu d'études portant sur la kinésiophobie dans le contexte de la thérapie de la main, des blessures et des maladies de la main.

Objectif/implication: L'objectif de cette recherche de littérature est de donner un aperçu actuel du thème de la kinésiophobie en rééducation de la main, d'identifier les questions ouvertes et d'étudier l'existence d'approches spécifiques liées à la pratique. En outre, il s'agit de montrer comment la kinésiophobie peut être saisie et mesurée ainsi que de vérifier la fiabilité et la validité des instruments d'évaluation existants pour la thérapie de la main.

Méthode: Recherche de littérature dans des bases de données telles que PubMed, Cinahl, MedLine, ainsi que dans des livres spécialisés.

Résultats: Les résultats et les constatations qui en découlent seront présentés lors du congrès.

Huang, J., Xu, Y., Xuan, R., Baker, J. S., & Gu, Y. (2022). A Mixed Comparison of Interventions for Kinesiophobia in Individuals With Musculoskeletal Pain: Systematic Review and Network Meta-Analysis. *Front Psychol*, 13, 886015. <https://doi.org/10.3389/fpsyg.2022.886015>

Pagels, L., Lüdtke, K., & Schäfer, A. (2022). Kinesiophobie bei Schulterbeschwerden. *Der Schmerz*. <https://doi.org/10.1007/s00482-022-00678-2>

Tuna, Z., & Oskay, D. (2018). Fear of movement and its effects on hand function after tendon repair. *Hand Surg Rehabil*. <https://doi.org/10.1016/j.hansur.2018.05.004>

Freie Mitteilungen / Communications libres II

FM64

Wo fang ich an, wann hör ich auf? Gezielte Therapie trotz unklarer Diagnose und fehlenden Ressourcen

Esther Marthaler¹, Livia Andrey² (¹Bern; ²Biel)

Hintergrund: Die Diagnose auf der Verordnung lautet „Restbeschwerden nach Handgelenksdistorsion; Polyarthrose; Schwäche in den Händen nach xy“ oder ähnlich. Die Erwartung der Patientin ist, dass es „wieder wird wie vorher“. Bei kaum freien Therapieplätzen lässt sich der unklare, mühsame und lange Weg erahnen, bis die Therapie mit gutem Gewissen wieder abgeschlossen werden kann.

Der Vorstand der Schweizerischen Akademie der Medizinischen Wissenschaften stellt fest: „Das Gesundheitsverlangen ist unbegrenzt, die Ressourcen sind begrenzt“ (SAMW, 2019). Diese Aussage wiederspiegelt das zunehmende Dilemma der ergotherapeutischen Tätigkeit. Im Berufskodex des EVS sind die drei Qualitätsmerkmale der Wirksamkeit, Zweckmässigkeit und Wirtschaftlichkeit beim Einsatz der zur Verfügung stehenden Mittel festgehalten. Doch wie setzt man dies im Therapiealltag in Situationen, wie oben beschrieben, ganz konkret um?

Ziel: Es wird eine aus der Praxis entstandene Struktur präsentiert, wie die Therapie unter oben genannten oder ähnlichen Umständen aufgebaut werden kann. Die Struktur soll helfen, ziellose, verzettelte und unnötige Behandlungen zu vermeiden indem sie die Therapeutin im Clinical Reasoning unterstützt und ihr hilft, sich zu positionieren.

Methode: Im Rahmen des Qualitätszirkels einer Handtherapiepraxis wurde die eingangs genannte Erfahrung reflektiert und die vorhandenen Strategien und Vorgehensweisen gesammelt. Folgende Fragen dienten zur Orientierung: Was hilft uns, die Therapie in solchen Momenten zu strukturieren, die Patientin zu führen, unsere Ressourcen optimal zu nutzen und eine klare Vorstellung vom gesamten Behandlungsbogen von der ersten bis zur letzten Therapie zu haben?

Resultat: Die Strategien und Vorgehensweisen wurden in einen zeitlichen Ablauf eingeordnet und so eine Art Leitfaden zur Orientierung erstellt,

wobei der Inhalt möglichst alltagsnah formuliert wurde.

Anwendung für die Praxis: Das Ergebnis des Qualitätszirkels soll zur aktuellen Diskussion zum Thema smarter medicine beitragen und anregen, die eigene Therapiegestaltung kritisch zu betrachten.

Par où commencer, quand s'arrêter ? Une thérapie ciblée malgré un diagnostic peu clair et le manque de ressources

Esther Marthaler¹, Livia Andrey² (¹Berne; ²Bielle)

Contexte: Le diagnostic sur l'ordonnance annonce « douleurs persistantes après une entorse du poignet ; polyarthrose ; faiblesse dans les mains après xy » ou quelque chose de similaire. Le patient s'attend à ce que « tout redevienne comme avant ». Peu de places sont disponibles en thérapie et un long chemin, peu clair et fastidieux se présente jusqu'à ce que le traitement puisse se terminer en toute bonne conscience.

Le comité de l'Académie suisse des sciences médicales a constaté : « Le désir de santé est illimité, les ressources sont limitées » (ASSM, 2019). Cette citation reflète le dilemme croissant de l'activité ergothérapeutique. Dans le code déontologique de l'ASE, les trois critères représentant la qualité sont l'efficacité, l'adéquation et l'économie dans l'utilisation des moyens à disposition. Mais comment les mettre concrètement en application dans le quotidien thérapeutique lors de situations telles que décrites ci-dessus ?

Objectif: Une structure créée à partir de la pratique sur la manière dont la thérapie peut être mise en place dans les circonstances sus-mentionnées ou semblables sera présentée. Cette structure doit permettre d'éviter une prise en charge sans but, dispersée et inutile en soutenant le thérapeute dans le raisonnement clinique et en l'a aidant à se positionner.

Méthode: Dans le cadre d'un cercle de qualité d'un cabinet en rééducation de la main, les expériences mentionnées ci-dessus ont fait l'objet d'une réflexion et les stratégies et procédures y étant associées ont été rassemblées. Les questions suivantes ont servi d'orientation : Qu'est-ce qui nous aide à structurer la thérapie dans de tels moments, à guider le patient, à utiliser nos ressources de manière optimale ainsi qu'à avoir une vision claire de l'ensemble du dossier, de la première à la dernière séance de thérapie ?

Résultats: Les stratégies et les procédures ont été classées dans un ordre chronologique, créant ainsi une sorte de guide pratique pour s'orienter et dont le contenu a été formulé de manière à être le plus proche possible du quotidien.

Pertinence pratique: Le résultat du cercle de qualité doit contribuer à l'actuelle discussion sur le thème de la « Smarter Medicine » et inciter à porter un regard critique sur sa propre conception de la thérapie.

Beauchamp, T. L., Childress, J. F. (2019). *Principles of Biomedical Ethics*. Vereinigtes Königreich: Oxford University Press.

Bracher, G. (2022, 11. August). *Ethische Entscheidungsfindung in der Ergotherapie* [Vorlesungsfolien]. Kurstag, Biel.

Nachhaltige Entwicklung des Gesundheitssystems. (2019). Schweiz: Schweiz. Akademie der medizinischen Wissenschaften (SAMW).

FM65

All for one – back on track!

Jenny Niederhäuser¹, Patricia Kammermann¹
(¹Bern)

Hintergrund: Im September 2022 erlitt ein 18-jähriger Patient bei einem Arbeitsunfall eine schwere devaskularisierende Fräsenverletzung der dominanten Hand. Die Handtherapie wurde während dem stationären Aufenthalt im Teamteaching einer berufserfahrenen Ergotherapeutin und einer Berufseinsteigerin aufgenommen und im weiteren Verlauf ambulant, in Kombination mit einer wohnortsnahen Handtherapie, weitergeführt.

Ziel: Das Fallbeispiel soll Aussenstehenden aufzeigen, wie dank einer erfolgreichen interdisziplinären Zusammenarbeit und unter Einbezug begünstigender Faktoren des Patienten eine frühe return-to-work Zeit sowie die baldige Aufnahme von gewohnten Freizeitaktivitäten erreicht werden konnte.

Methodik: Diese Fallpräsentation stellt nebst handtherapeutischen Ansätzen das Teamteaching in den Vordergrund. So arbeitete eine berufserfahrene Ergotherapeutin mit einer Berufseinsteigerin zusammen und übergab dieser Schritt für Schritt mehr Verantwortung in der Behandlung von komplexen Handverletzungen, im klinischen Prozess und in der Kommunikation mit externen Institutionen.

Resultate: Dank der hohen Motivation des Patienten konnten früh erfreuliche Resultate bezüglich Mobilisation, Sensibilität und Einsatz der Hand im Alltag dokumentiert werden. Das Teamteaching steigerte bei der Berufseinsteigerin die Handlungskompetenzen, das Wissen bei der Therapie von komplexen Handverletzungen sowie die Fähigkeit mit externen Therapeut:innen zusammenzuarbeiten.

Implikationen für die Praxis: Das Teamteaching und der ständige Austausch und Klärung der Aufgaben mit externen Handtherapien trägt wesentlich zum guten Gelingen der Rehabilitation nach komplexen Handverletzungen bei.

All for one – back on track!

Jenny Niederhäuser¹, Patricia Kammermann¹
(¹Berne)

Contexte: En septembre 2022, un patient de 18 ans a subi une sévère dévascularisation de sa main dominante suite à un accident de fraisage au travail. La rééducation de la main a été initiée pendant l'hospitalisation, en team teaching par une ergothérapeute expérimentée et une ergothérapeute débutante, et poursuivie par la suite en ambulatoire, en collaboration avec un cabinet de rééducation de la main proche du domicile.

Objectif: Cet exemple de cas doit montrer aux personnes extérieures comment, grâce à une collaboration interdisciplinaire réussie et en tenant compte des facteurs favorisants du patient, il a été possible d'obtenir un retour au travail précoce ainsi qu'une reprise rapide des activités de loisirs habituelles.

Méthode: Cette présentation de cas met en avant, outre les approches thérapeutiques de la main, l'apprentissage en équipe. Ainsi, une ergothérapeute expérimentée a travaillé en collaboration avec une ergothérapeute débutante, lui confiant peu à peu plus de responsabilités dans le traitement de lésions complexes de la main, dans le processus clinique et dans la communication avec les institutions externes.

Résultats: Grâce à la grande motivation du patient, des résultats réjouissants concernant la mobilité, la sensibilité et l'utilisation de la main dans la vie quotidienne ont pu être documentés. Le team teaching a permis d'accroître les compétences pratiques de la jeune professionnelle, ses connaissances en matière de traitement des lésions complexes de la main ainsi que sa capacité à collaborer avec des thérapeutes externes.

Pertinence pratique: Le team teaching ainsi que l'échange permanent et la clarification des tâches avec des thérapeutes de la main externes contribuent considérablement au bon déroulement de la prise en charge lors de lésions complexes de la main.

Mohamad Sabri, M. Q., Judd, J., Ahmad Roslan, N. F., & Che Daud, A. Z. (2022). Hand characteristics and functional abilities in predicting return to work in adult workers with traumatic hand injury. *Work*, (Preprint), 1-9.

Tezel, N., & Can, A. (2020). The association between injury severity and psychological morbidity, hand function, and return to work in traumatic hand injury with major nerve involvement: A one-year follow-up study. *Turk. J. Trauma Emerg. Surg*, 26, 905-910.

Valdes, K., Short, N., Gehner, A., Leipold, H., Reid, M., Schnabel, J., Veneziano, J. (2022). Developing a student competency exam for hand therapy clinical experiences: a cross-sectional survey of hand therapists. *Journal of Hand Therapy*, 35(1), 3-10. <https://dx.doi.org/10.1016/j.jht.2020.10.008>

FM66 Incorporation of Multidimensional Adherence Model in a case of non adherence patient

Pagella Susanna¹, Mario Fioretti¹, Francesca Ferrario¹, Thomas Giesen¹ ('Lugano)

Introduction: Do not achieve satisfactory results, they often question what went wrong with the treatment. In some cases, the patient is labeled as non-compliant, as they may fail to follow the prescribed exercise program or remove necessary equipment, such as a splint, despite being advised to wear it consistently. However, a review of the literature suggests that using the term "compliance" in this context implies a physician-centric control approach, which does not align well with the patient-centered practice philosophy of our profession. Instead, the term "adherence" more accurately captures the therapist's intention. In 2003, the World Health Organization published the Multidimensional Adherence Model (MAM), which categorizes key predictors into five dimensions: socioeconomic, health care system-related, condition-related, treatment-related, and patient-related factors.

Objective: The estimated non-adherence rate among patients with acute hand injuries is 25%. As therapists, can we enhance treatment adherence in our patients by applying the MAM?

Case Report: A 43-year-old female was conservatively treated after a radial head fracture. After 4 months pains are getting worse especially on the ulnar side. Patient came at our facility where she underwent surgery to reduce subluxation ulna head and to fixation the TFCC. By applying the MAM we discover that she has lost trust with the hospital team, as she had already been visited by other surgeons, family doctors, orthopedic specialists and therapists who had created a lot of confusion about proceeding. Patient expressed discomfort at still having to wear a cast that immobilized the elbow and wrist for another 6 weeks. Immediately the patient also complained of discomfort due to the disability linked to the left limb and the pain in the shoulder. (Quick DASH 95). Explaining the rehabilitation phases to the patient, setting goals together, looking for modifications for the splint, in order to decrease the patient's sense of disability. But above all by creating a work team, surgeon, hand therapist and physiotherapist, we were able to regain the patient's trust and obtain a good result. (quick DASH 18)

Conclusions: Although a single case report is insufficient to demonstrate that a multidisciplinary approach enhances adherence to hand therapy rehabilitation protocols, it is important not to blame the patient when a rehabilitation intervention fails to yield the desired outcomes

FM67 Nachbehandlung operativ entfernter, dorsaler Handgelenkganglien – was sagt die Evidenz?

Stefanie Widmer¹, Bettina Pather¹, Tiziana Colombo¹, Daniela Keller¹ ('Bern)

Die therapeutische Nachbehandlung operativ entfernter, dorsaler Handgelenkganglien gestaltet sich im Therapiealltag aufgrund anhaltender Schmerzen sowie Einschränkung in der Handgelenksflexion oftmals als schwierig. Ziel der Literaturrecherche ist es, die effektivste Nachbehandlung in Bezug auf Beweglichkeit, Schmerz und Arbeitsausfall zu evaluieren.

Die Recherche erfolgte in verschiedenen medizinischen Datenbanken. Immobilisation des Handgelenks in 0°-30° Extension für maximal 3 Wochen mittels Schiene wird in der Hälfte der Studien angewendet, die restlichen Studien beschränken die Handgelenksbeweglichkeit nach der Operation nicht (Wong et al., 2023).

Studien belegen eine klinisch relevante Verbesserung der Schmerzen und Handfunktion nach Ganglionexcision am Handgelenk (Greminger et al., 2023). Wichtig ist eine gute präoperative Aufklärung, denn eine geringe Glaubwürdigkeit in die Behandlung führt nachweislich zu schlechteren Ergebnissen. Ruhigstellung für max. 2 Wochen oder keine Immobilisation nach der Operation zeigen keinen eindeutigen Unterschied. Vorhandene Studien zur Nachbehandlung sind durch kurzes Follow up, kleine Probandengruppe, fehlende Kontrollgruppe und unterschiedliche Messwerte noch wenig aussagekräftig. Ruhigstellen ja oder nein? Ausschlaggebend für ein gutes, postoperatives Resultat ist ein klientenzentriertes Vorgehen.

Prise en charge suite à l'ablation chirurgicale d'un ganglion sur la face dorsale du poignet – que disent les preuves ?

Stefanie Widmer¹, Bettina Pather¹, Tiziana Colombo¹, Daniela Keller¹ (¹Berne)

La prise en charge après l'ablation chirurgicale d'un ganglion sur la face dorsale du poignet s'avère souvent difficile dans le quotidien thérapeutique en raison de la persistance des douleurs ainsi que de la limitation de la flexion du poignet. L'objectif de cette revue de littérature est d'évaluer le traitement post-opératoire le plus efficace en termes de mobilité, de douleur et d'arrêt de travail.

La recherche a été effectuée dans différentes bases de données médicales. L'immobilisation du poignet en extension à 0°-30° pour maximum trois semaines au moyen d'une attelle a été retrouvée dans la moitié des études, l'autre moitié des publications ne mentionnant pas la limitation de la mobilité du poignet après l'opération (Wong et al., 2023).

Des études démontrent une amélioration cliniquement significative des douleurs et de la fonction de la main après l'excision d'un ganglion au poignet (Greminger et al., 2023). Il est important de fournir des informations complètes lors de l'entretien préopératoire car il est prouvé qu'une faible crédibilité dans le traitement mène à de moins bons résultats. Une immobilisation de maximum deux semaines ou l'absence d'immobilisation après l'opération ne montrent pas de différence significative. Les études existantes sur le traitement post-opératoire sont encore peu concluantes en raison d'un suivi de courte durée, d'un petit groupe de participants, de l'absence de groupe contrôle et de moyens de mesure variables.

L'immobilisation, oui ou non ? Le facteur décisif pour obtenir un bon résultat post-opératoire est une prise en charge centrée sur le client.

FM68 Berufsbezogene Anforderungen und Ressourcen von Handtherapeut*innen

Fabienne Müller¹ (¹Winterthour)

Das Arbeitsleben beeinflusst die Gesundheit der Arbeitnehmenden und die Produktivität von Unternehmen und letztlich das Wohlergehe der gesamten Bevölkerung eines Landes. Der Fachkräftemangel im schweizerischen Gesundheitswesen wirft Fragen zur Versorgungsqualität auf. Handtherapeut*innen erleben Belastungen, wie Burnout, Abwesenheit und Fluktuation. Die hohe Komplexität ihrer Arbeit resultiert aus kognitiven, emotionalen und körperlichen Anforderungen, Interesse und Motivation, klient*innenbezogenen Faktoren und sozialen Interaktionen im Team. Dies kann berufsbedingten Stress verursachen, der zu gesundheitlichen Problemen führt. Eine gesunde Gestaltung der Arbeit kann dem entgegenwirken. Anhand des Job-Demands-Resources Model wird aufgezeigt, welche Anforderungen und Ressourcen bei Handtherapeut*innen bestehen und welche Möglichkeiten es gibt die Gesundheit der Handtherapeut*innen möglichst zu erhalten oder zu verbessern. Handtherapeut*innen erleben regelmässig körperliche Beeinträchtigungen durch ihre Arbeit. Zeitdruck und eine hohe Anzahl von Behandlungsterminen sind häufige psychische Belastungsfaktoren. Das psychosoziale Arbeitsumfeld und das Organisationsklima beeinflussen das Risiko arbeitsbedingten Stresses. Handtherapeut*innen benötigen Ressourcen, um Arbeitsanforderungen zu bewältigen. Fehlende Ressourcen oder Unterstützung können zu Stress führen. Daraus lassen sich zwei handlungsleitende Perspektiven ableiten: Gesundheitliche relevante Belastungen in den Arbeitsbedingungen reduzieren und gesundheitsfördernde Faktoren in der Arbeit stärken.

Exigences et ressources professionnelles des thérapeutes de la main

Fabienne Müller¹ (¹Winterthour)

La vie professionnelle influence la santé des travailleurs et la productivité des entreprises et, finalement, le bien-être de la population de tout un pays. La pénurie de personnel qualifié dans le secteur de la santé en Suisse soulève des questions

sur la qualité des soins. Les thérapeutes de la main subissent des pressions telles que l'épuisement professionnel, l'absentéisme et le turnover. La grande complexité de leur travail résulte des exigences cognitives, émotionnelles et physiques, de l'intérêt et de la motivation, des facteurs liés aux patients et des interactions sociales au sein de l'équipe. Cela peut provoquer un stress professionnel entraînant des problèmes de santé. Un aménagement sain du travail peut y remédier. Le modèle Job-Demands-Resources décrit les exigences et les ressources chez les thérapeutes de la main et les possibilités de préserver ou d'améliorer la santé des thérapeutes de la main. Les thérapeutes de la main souffrent régulièrement d'atteintes physiques en lien avec leur travail. La pression temporelle et le nombre élevé de rendez-vous thérapeutiques sont des facteurs de stress psychologique fréquents. L'environnement psycho-socio-professionnel et le climat organisationnel influencent le risque de stress lié au travail. Les thérapeutes de la main ont besoin de ressources pour faire face aux exigences du travail. Le manque de ressources ou de soutien peut entraîner un stress. Deux perspectives d'action peuvent en ressortir : réduire les contraintes importantes pour la santé dans les conditions de travail et renforcer les facteurs de promotion de la santé dans le travail.

Bakker, A., Hakanen, J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high.

Golz, C., & Peter, K., (2017). Wie kriegt das Gesundheitswesen die Arbeitsbelastung in den Griff? Håkansson, C., & Lexén, A. (2023). Work conditions as predictors of Swedish occupational therapists' occupational balance.

Lexén, A., Kalsås, K., Liiri, J., & Håkansson, C. (2021). Perceived job strain among Swedish occupational therapists with less than 10 years of work experience.

Mullaney, R. J. (2017). Workplace factors affecting the delivery of occupational therapy services: Perspectives of occupational therapy practitioners.

Wolf, K., (2011). Belastungsfaktoren bei Ergotherapeuten, Physiotherapeuten und Logopäden.

World Health Organization (1948). Constitution of the World Health Organization, Geneva.

FM69

Gruppenbasierte Instruktion nach Karpaldachspaltung - Rückschau auf ein Jahr Erfahrung

Selina Kolb¹, Lea Feller¹ (Winterthur)

Hintergrund: Am Kantonsspital Winterthur werden jährlich rund 250 Karpaldachspaltungen durchgeführt, was eine relativ grosse Patientengruppe darstellt. Patient/-innen nach Karpaldachspaltung wurde bisher nicht direkt für die Therapie angemeldet, weil sich der Verlauf sehr häufig komplikationslos gestaltet. Allerdings gibt es immer wieder Fälle, bei denen Patient/-innen postoperativ therapiebedürftig werden. Dies meist aufgrund einer eingeschränkten Mobilität, Sensibilität und/oder Kraft, beziehungweise aufgrund einer störenden Narbe. Ein solcher postoperativer Zustand kann den Handeinsatz im täglichen Leben deutlich einschränken. Die Hypothese ist, dass wenn Patient/-innen zeitnah einmalig handtherapeutisch instruiert werden, mehr Sicherheit gewinnen und auch grössere Verantwortung für den Rehabilitationsprozess übernehmen können.

Ziel: Das Ziel einer gruppenbasierten Instruktion nach Karpaldachspaltung besteht in der Wissensvermittlung bezüglich dem postoperativen Heilungsverlauf und der selbständigen Nachbehandlung durch die Patient/-innen. Zusätzlich besteht die Möglichkeit, dass sich die Teilnehmenden – falls gewünscht – auch untereinander austauschen können. Dies kann den Heilungsverlauf zusätzlich positiv beeinflussen.

Methode: Alle Patientinnen und Patienten, denen am Kantonsspital Winterthur das Karpaltunnelsyndrom mittels Karpaldachspaltung operiert wurden, erhielten per Brief die Einladung für das Gruppenangebot zwei bis drei Wochen postoperativ. Mittels Fragebogen wurde der Informationsgewinn, die Wahrnehmung der Gruppe, die Zufriedenheit und das Erreichen der Erwartungen evaluiert. Zusätzlich wurden die Teilnehmerzahlen erhoben.

Diskussion: Aktuell konnte bezüglich gruppenbasierten Instruktionen in der Handtherapie keine Evidenz gefunden werden. Insgesamt ist die Resonanz der Teilnehmenden aber sehr positiv. Es gibt jedoch Studien, welche die Notwendigkeit der Handtherapie nach komplikationslosen Karpaldachspaltungen hinterfragen. Noch ist unklar, ob der Gewinn für die Teilnehmenden aus dem Gruppenangebot den administrativen Aufwand und die entstandenen Kosten überwiegt.

Groupe thérapeutique après un tunnel carpien – retour sur une année d’expérience

Selina Kolb¹, Lea Feller¹ (¹Winterthour)

Contexte : A l’hôpital cantonal de Winterthour, environ 250 cures de tunnel carpien sont effectuées chaque année, ce qui représente un groupe relativement important de patients. Jusqu’à présent, les patients n’étaient pas directement adressés en thérapie après une cure du tunnel carpien car il y a très peu de complications suite à une telle intervention. Cependant, il y a toujours des cas où les patients ont besoin d’un suivi thérapeutique post-opératoire. Cela est généralement dû à une mobilité, une sensibilité et/ou une force limitée, ou en raison d’une cicatrice gênante. Un tel état post-opératoire peut restreindre considérablement l’utilisation de la main au quotidien. L’hypothèse est que si les patients reçoivent rapidement une unique séance de rééducation de la main, ils gagnent en assurance et peuvent assumer une plus grande responsabilité dans le processus de réhabilitation.

Objectif : L’objectif d’un groupe thérapeutique après une cure du tunnel carpien est de transmettre des connaissances sur le processus de guérison post-opératoire et sur le traitement auto-administré par les patients. De plus, les participants ont également la possibilité – s’ils le souhaitent – d’échanger entre eux. Cela peut avoir une influence positive sur le processus de guérison.

Méthode : Toutes les patientes et tous les patients souffrant d’un syndrome du tunnel carpien ayant été opérés d’une libération du nerf médian à l’Hôpital cantonal de Winterthour ont reçu par courrier postal une invitation à participer à ce groupe thérapeutique deux à trois semaines après l’opération. Le gain d’informations, la perception du groupe, la satisfaction et la réalisation des attentes ont été évalués à l’aide d’un questionnaire. De plus, le nombre de participants a été relevé.

Discussion : Actuellement, aucune preuve n’a pu être trouvée quant à ce groupe thérapeutique. De manière générale, l’écho des participants est toutefois très positif. Certaines études remettent cependant en question l’utilité de la thérapie de la main suite à une cure du tunnel carpien sans complications. Il n’a pas encore été établi que le bénéfice que les participants retirent de l’offre en groupe l’emporte sur la charge administrative et les coûts occasionnés.

Freie Mitteilungen / Communications libres III

FM71

Behandlungskonzept nach Nerventransfers der oberen Extremitäten am Universitätsspital Zürich

Iris Schütz¹ (¹Zürich)

Einführung: Traumatische Plexusverletzungen und Nervenläsionen schränken Betroffene oft lebenslang ein. Nerventransfers bieten die Möglichkeit, motorische und sensorische Funktionen wiederherzustellen (1). Das Resultat hängt dabei von der erfolgreichen Reinnervation des Zielmuskels, von der kortikalen Plastizität und dem motorischen Umlernprozess ab (2). Das sensomotorische Umlernen nach einer Nervenrekonstruktion ist ein kognitiv anspruchsvoller Prozess. Ein strukturiertes Rehabilitationsprogramm mit Patientenaufklärung und Heimprogramm ist unerlässlich, um ein optimales funktionelles Ergebnis zu erzielen (3).

Ziel: Aufzeigen eines Behandlungsprotokolls nach Nerventransferoperationen der oberen Extremitäten. Die Rehabilitationsphasen werden anhand von Patientenbeispielen, einer Therapeutenanleitung und einer Patientenbroschüre vorgestellt.

Methode: Literatursuche zu Rehabilitation nach Nerventransfer und Austausch mit Fachexpertinnen der Medizinischen Universität Wien.

Ergebnisse und Implikation: Das erarbeitete Behandlungsprotokoll definiert die für die Reorganisation des peripheren und zentralen Nervensystems erforderlichen Phasen und führt das Behandlungsteam sowie Patientinnen und Patienten durch den langen Rehabilitationsprozess (1).

Die Therapieschwerpunkte liegen phasenabhängig auf der Patientenaufklärung und einer Aktivierung der denervierten kortikalen Areale, gefolgt von Aktivierung des reinnervierten Muskels mittels Aktivierung des Spendermusters und schlussendlich auf der Entkopplung vom Spendermuskel und dem Wiedererlernen der natürlichen Bewegungsmuster des Empfängernervs (1).

Das Protokoll ist einfach zu verstehen und fördert das Verständnis und die Mitwirkung der Betroffenen. Es verbessert die Kommunikation zwischen den behandelnden Disziplinen sowie mit

externen Therapeutinnen und Therapeuten, welche die wohnortsnahe Behandlung übernehmen.

Protocole de traitement après un transfert nerveux du membre supérieur à l'Hôpital universitaire de Zurich

Iris Schütz¹ (¹Zurich)

Introduction: Les blessures traumatiques du plexus brachial et les lésions nerveuses limitent souvent à vie les personnes concernées. Les transferts nerveux offrent la possibilité de restaurer les fonctions motrices et sensorielles (1). Le résultat dépend de la réussite de la réinnervation du muscle cible, de la plasticité corticale et du processus de réapprentissage moteur (2). Le réapprentissage sensori-moteur après une reconstruction nerveuse est un processus cognitivement exigeant. Un programme de réhabilitation structuré, comprenant une éducation du patient et un programme à domicile est indispensable afin d'obtenir un résultat fonctionnel optimal (3).

But: Présentation d'un protocole de traitement post-opératoire pour un transfert nerveux du membre supérieur. Les phases de rééducation seront présentées à l'aide d'exemples de patients, d'instructions pour le thérapeute et d'une brochure destinée aux patients.

Méthode: Revue de littérature sur la rééducation après un transfert nerveux et échange avec des expertes de l'Université de médecine de Vienne.

Résultats et implications: Le protocole de traitement élaboré définit les phases nécessaires à la réorganisation des systèmes nerveux périphérique et central et guide l'équipe soignante, ainsi que les patientes et les patients, à travers un long processus de rééducation (1).

L'accent thérapeutique est mis, en fonction des phases, sur l'éducation du patient et l'activation des zones corticales dénervées, l'activation du muscle réinnervé au moyen de l'activation de l'échantillon du donneur et, finalement, le découplage du muscle donneur et le réapprentissage des schémas de mouvements naturels du nerf receveur (1).

Le protocole est simple à intégrer et favorise la compréhension et la participation des personnes concernées. Il améliore la communication entre les divers professionnels ainsi qu'avec les thérapeutes externes qui prennent en charge le traitement à proximité du domicile.

Struma, A., Hruba, L. A., Farina, D., Aszmann, O. C. (2019). Structured Motor Rehabilitation After Selective Nerve Transfers. *J. Vis. Exp.*, 150.

Sturma, A., Hruba, L. A., Prahm, C., Mayer, J. A., Aszmann, O. C. (2018). Rehabilitation of Upper Extremity Nerve Injuries Using Surface EMG Biofeedback: Protocols for Clinical Application. *Frontiers in neuroscience*, 12: 906.

Novak, C. B. (2008). Rehabilitation following motor nerve transfers. *Hand Clinics*, 24: 417–423.

FM72

Clinical reasoning in rehabilitation in conservative treatment of extra-articular P1 fractures

Carine Rambaud¹, Carolina Mesoraca¹, Stéphanie Rosca-Furrer² (¹Neuchâtel; ²La Chaux-de-Fonds)

In the literature, it is reported that extra-articular proximal phalanx (P1) fractures are regularly treated surgically with complications of hand dysfunction and delayed return to work, so conservative treatment is often recommended. To try to overcome these problems, also observed in our Occupational Therapy Department, we have developed a conservative protocol, based on literature and clinical experience, in the form of an algorithm to help therapists and surgeons develop a clinical reasoning about the way to treat these fractures, to choose appropriate exercises of early controlled mobilization and to adapt appropriate splints at the right time. To include fractures with rotation and/or apex deformity in our conservative management, we introduced Kinesio® Taping in combination with our splints to maintain rotation correction and added a temporary traction splint to maintain apex reduction. No study has been done to compare results between conservative and operative treatment, but clinical observations on X-rays, increased patient satisfaction and fewer therapy sessions have led us to continue and develop this protocol for three years now.

Feehan, L.M (2021). Therapy management of Extraarticular Hand Fractures. In T.M Skirven(Dir.), *Rehabilitation of the Hand and Upper Extremity* (7e éd.) (pp.295–309). Philadelphia : Elsevier.

Hopkins, A., Barry, N. P., Bowman, S. R., Sathasivam, S., Kumar, R. J., Prektes, A. P., & Dowd, M. B. (2022). Traction splinting (EAVAST protocol) versus operative fixation of proximal phalanx fractures: a comparative study of patient outcomes. *Australasian Journal of Plastic Surgery*, 5(1), 68-73.

MacDonald, K., Larocerie-Salgado, J., & Chinchalkar, S. (2022). Alternative Noninvasive Treatment of Unstable Extra-articular Proximal and Middle Phalangeal Fractures: A Static Linear Traction Orthosis Design. *Techniques in Hand & Upper Extremity Surgery*, 26(2), 110-113.

Nicolet, R. & Rambaud, C. (2019). Revue de littérature et raisonnement clinique autour des fractures de P1 traitées conservativement. *Promanu*, 2, 14-18.

Peacock, C. J. H., Bellringer, S. F., & Oliveira, M. L. R. (2021). A simple middle and ring finger traction splint modification. *The Annals of The Royal College of Surgeons of England*, 103(1), 79-81.

FM73 Medical Flossing bei Rhizarthrose

Eine prospektive Studie mit 30 Patienten mit Follow up

Nicole Plüss¹, Susanne Habelt², Jörg Grünert³
(¹St.Gallen; ²St. Gallen; ³Goldach)

Hintergrund: Der Daumen und das Daumensattelgelenk sind von grosser Bedeutung und bei vielen Bewegungen im alltäglichen Leben unerlässlich. Bei Rhizarthrose kann es zu Schmerzen und Funktionsbeeinträchtigungen kommen. Als Therapieoption stehen eine ganze Reihe von konservativen und operativen Therapiemassnahmen zur Verfügung.

Das Medical Flossing ist eine Therapie, die ursprünglich aus dem Spitzensport kommt und erst in den letzten Jahren in die Handtherapie Einzug gehalten hat. Das Medical Flossing regt Regenerations- und Reparaturmechanismen an.

Fragestellung: Bei der Daumensattelgelenksarthrose wird das Medical Flossing mit einer Wiederholung pro Sitzung empfohlen. Sind mehrere Wiederholungen effektiver und nachhaltiger bezüglich Schmerzlinderung, der Verbesserung des Bewegungsausmasses und der Qualität der Beweglichkeit?

Methode: Es handelt sich um eine prospektive Studie, mit 30 Patienten, 25 Frauen und 5 Männer, im Alter zwischen 37 und 61 Jahren, die innerhalb eines Jahres in die Studie aufgenommen wurden, unabhängig vom Schweregrad der Rhizarthrose. Im ersten Monat der Therapie erhielten die Patienten der Gruppe A zwei Wiederholungen und die Patienten der Gruppe B drei Wiederholungen des Medical Flossings pro Therapiesitzung. Im zweiten

Monat erhielten dann beide Gruppen A und B jeweils drei Wiederholungen der Flossing Therapie pro Therapie Sitzung. Es wurden neben ROM und Kraft (Jamar, Pinch) auch ein Quick DASH score sowie eine Schmerzeinschätzung (VAS 1-10) vor und nach der Therapie und die Qualität der Beweglichkeit erfasst.

Nach 6 - 12 Monaten erfolgte eine Nachkontrolle, darin konnten 28 Patienten erfasst werden.

Ergebnisse: Hinsichtlich der Gelenksbeweglichkeit zeigte die Gruppe, welche drei Wiederholungen pro Sitzung hatte eine deutliche Verbesserung Bewegungsqualität, der Kraft und der Schmerzen. Der Quick DASH score sank von 54 und 25 am Ende der Therapie.

Durchschnittliche Nachkontrollzeitpunkt war 8 Monate (6 - 12 Monate) nach abgeschlossener Flossing Therapie. Es wurden 28 Patienten nachkontrolliert. Bei allen Patienten waren die Verbesserungen immer noch klar feststellbar.

Schlussfolgerung: Diese Studie zeigt, dass eine repetitive Anwendung des Medical Flossing zu einem nachhaltigen Erfolg betreffend Bewegungsqualität und einer anhaltenden Schmerzreduktion führt. Alle 28 Patienten waren mit der konservativen Therapie des Medical Flossings sehr zufrieden und würden diese Therapiemethode wieder wählen.

Medical flossing lors d'une rhizarthrose

Une étude prospective portant sur le suivi de 30 patients

Nicole Plüss¹, Susanne Habelt², Jörg Grünert³
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Contexte: Le pouce et l'articulation en selle du pouce sont d'une grande importance et indispensable à de nombreux mouvements de la vie quotidienne. En cas de rhizarthrose, des douleurs et des déficits fonctionnels peuvent survenir. Toute une série de mesures conservatrices et chirurgicales sont à disposition comme options thérapeutiques.

Le medical flossing est une thérapie qui vient à l'origine du sport de haut niveau et qui n'a fait son entrée dans la thérapie de la main que ces dernières années. Le medical flossing stimule les mécanismes de régénération et de réparation.

Question: Lors d'une arthrose de l'articulation CMC 1, une répétition de medical flossing est recommandée par séance. Est-ce que plusieurs répétitions sont plus efficaces et plus durables en termes de soulagement de la douleur,

d'amélioration des amplitudes de mouvement et de qualité de la mobilité ?

Méthode: Il s'agit d'une étude prospective portant sur 30 patients, dont 25 femmes et 5 hommes, âgés entre 37 et 61 ans, qui ont été inclus dans l'étude en l'espace d'un an indépendamment du degré de gravité de leur rhizarthrose. Au cours du premier mois de traitement, les patients du groupe A ont reçu deux répétitions de medical flossing et les patients du groupe B trois répétitions de medical flossing par séance de thérapie. Lors du deuxième mois, les deux groupes A et B ont reçu à chaque fois trois répétitions de medical flossing par séance de thérapie. L'enregistrement des amplitudes articulaires, de la force (Jamar, Pinch), du score au Quick DASH, de l'évaluation de la douleur (EVA 1-10) avant et après la thérapie ainsi que de la qualité de la mobilité a été effectué.

Un rendez-vous de contrôle a eu lieu au bout de 6 à 12 mois, auquel 28 patients ont pris part.

Résultats: En regard de la mobilité articulaire, le groupe ayant reçu trois répétitions par séance a montré une amélioration considérable de la qualité du mouvement, de la force et de la douleur. Le score au Quick DASH est tombé de 54 à 25 en fin de traitement.

En moyenne, le suivi était de 8 mois (6 à 12 mois) après la fin de traitement par medical flossing. Vingt-huit patients ont été contrôlés. Chez tous les patients, les améliorations étaient encore clairement visibles.

Conclusion: Cette étude montre qu'une utilisation répétée du medical flossing conduit à un succès durable en ce qui concerne la qualité du mouvement et une réduction persistante de la douleur. Les 28 patients étaient très satisfaits du traitement conservateur à l'aide du medical flossing et choisiraient à nouveau cette méthode thérapeutique.



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FM74 Betätigungsorientierte Handtherapie – Tipps und Tricks für den Arbeitsalltag

*Bernadette Tobler-Ammann¹, Astrid Schmid²
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Der Beruf der Ergotherapie hat die Beschäftigung als zentrales therapeutisches Therapiemittel übernommen und angewendet. Dieses Konzept wurde auch in die Physiotherapie und Handtherapie integriert. Eigentlich erscheinen betätigungsorientierte Interventionen sowohl logisch als auch praktisch, um diese in Behandlungsprogrammen in verschiedenen klinischen Settings einzubeziehen¹. In der Kultur des biomechanischen Modells im Gesundheitswesen ist es jedoch eine Herausforderung, betätigungsorientierte Interventionen in der Handtherapiepraxis zu integrieren.

Unter einer betätigungsorientierten Intervention wird eine zweckgerichtete und bedeutungsvolle Aktivität für eine Person in ihrem sozialen Kontext verstanden¹. Zurzeit gibt es noch wenig Literatur betreffend Wirksamkeit und Integration von betätigungsorientierten Interventionen in der Behandlung von HandpatientInnen. Eine Übersichtsarbeit zum Thema zeigt auf, dass die vorhandene Literatur vielversprechende Trends im Einsatz von Betätigung als Behandlungsintervention für muskuloskelettale Beschwerden der oberen Extremität aufzeigt². Patienten gaben zum Beispiel an, zufriedener mit dem Behandlungsergebnis zu sein, da dieser kundenorientierte Ansatz hilft, die persönlichen Bedürfnisse des Patienten besser zu identifizieren. So werden die Wiedererlangung gewünschter Aktivitäten und Rollen zum Therapieziel, welches gemeinsam zwischen Therapeut und Patient entschieden und priorisiert wird. Zudem kann das Ausführen von Aktivitäten von der verletzten Hand ablenken und so deren Einsatz im Alltag verbessern.

Wie können denn nun betätigungsorientierte Interventionen in der Handtherapie umgesetzt werden? Sind diese überhaupt sinnvoll? In diesem Beitrag möchten wir über Herausforderungen und Chancen dieses Therapieansatzes in der Handtherapie sprechen und Tipps und Tricks für dessen Einsatz im Arbeitsalltag aufzeigen, wie zum Beispiel dem Überdenken des eigenen Einsatzes von Assessments oder der Suche nach Gleichgesinnten zum Austausch.

La rééducation de la main basée sur les occupations – trucs et astuces pour la pratique quotidienne

Bernadette Tobler-Ammann¹, Astrid Schmid²
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La profession d'ergothérapeute a adopté et appliqué l'occupation comme moyen thérapeutique central. Ce concept a également été intégré à la physiothérapie et à la rééducation de la main. En fait, les interventions basées sur l'occupation apparaissent à la fois logiques et pratiques à inclure dans les programmes de traitement de différents cadres cliniques¹. Pourtant, dans la culture du modèle biomécanique du domaine de la santé, l'intégration des interventions basées sur l'occupation dans la pratique de la rééducation de la main est un défi.

Par intervention basée sur l'occupation, on entend une activité ciblée et significative pour une personne dans son contexte social¹. Jusqu'à présent, il existe encore peu de publications concernant l'efficacité et l'intégration des interventions basées sur l'occupation dans le traitement des patients en thérapie de la main. Une revue de la littérature sur le sujet montre que les tendances existantes sont prometteuses en ce qui concerne l'utilisation des occupations comme moyen d'intervention thérapeutique pour les troubles musculo-squelettiques du membre supérieur². Les patients ont par exemple déclaré être plus satisfaits des résultats du traitement car cette approche centrée sur le client aide à mieux identifier les besoins personnels de ce dernier. Ainsi, la récupération des activités et des rôles souhaités devient un objectif thérapeutique décidé et priorisé conjointement par le thérapeute et le patient. De plus, la réalisation des activités peut détourner l'attention de la main blessée et ainsi améliorer son utilisation dans la vie quotidienne.

Comment les interventions basées sur l'occupation peuvent-elles être mises en place dans la thérapie de la main ? Sont-elles vraiment utiles ? Lors de cette présentation, nous aimerions parler des défis et des bénéfices de cette approche thérapeutique en rééducation de la main et montrer des trucs et astuces pour son utilisation dans la pratique quotidienne, comme par exemple la reconsideration de son propre recours aux évaluations ou la recherche de personnes partageant les mêmes idées afin d'échanger.

1. Valdes K, Naughton N, Téllez RC, Szekeres M.
The use of occupation-based interventions and assessments in hand therapy: A cross-sectional

survey. *J Hand Ther.* Dec 28 2021;doi:10.1016/j.jht.2021.10.008

2. Weinstock-Zlotnick G, Mehta SP. A systematic review of the benefits of occupation-based intervention for patients with upper extremity musculoskeletal disorders. *J Hand Ther.* Apr - Jun 2019;32(2):141-152. doi:10.1016/j.jht.2018.04.001

Freie Mitteilungen / Communications libres IV

FM75 Relative Motion for Limited Finger Joint Mobility: Understanding Applications and Decision-Making

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Relative motion (RM), initially introduced by Merritt et al. (2000) for the treatment of surgically repaired extensor tendons, has since been utilized in the management of various finger joint conditions such as flexion or extension limitations, trigger fingers, boutonniere deformities, and post-operative rehabilitation of flexor tendon repairs. One big advantage of relative motion orthoses (RMO) versus traditional splinting is that it allows the finger to move while influencing motion, this in turn means that the hand remains functional while wearing the RMO and thus can be worn for longer periods of time during hand activity. This paper explores the versatility of relative motion flexion and extension and addresses the critical question of when and how therapists should employ these techniques for finger joints with limited motion and when other techniques should be utilized. A comprehensive algorithm has been developed to aid in this decision-making process, which guides therapists in evaluating and selecting appropriate treatment options. In addition to thermoplastic splints, alternative relative motion placement methods and splint options will be presented, with case examples from clinical practice. Furthermore, this presentation will delve into other pertinent considerations for therapists, including determining the number of fingers to include in the relative motion orthosis, the differential of relative motion, and the duration of splint usage.

Merritt, WH, Howell JW, Tune R, et al. Achieving immediate active motion by using relative motion splinting after long extensor repair and sagittal band rupture with tendon subluxation. Oper Tech Plast Reconstr Surg 2000;7: 31–37
<https://doi.org/1053/oa.2000.5972>

FM76 Massgefertigte Lederschienen für manuell tätige Patient:innen bei Handgelenkschmerzen

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²Zollbrück)**

Hintergrund: Arthrose ist die häufigste Gelenkerkrankung (Rheumaliga Schweiz, 2023) und schränkt insbesondere manuell tätige Menschen ein. Für diese kann eine Handgelenksschiene entlastend wirken. Es gibt nur wenig Literatur über massgefertigte Handgelenksschienen aus Leder (Haskett et al., 2004; Thiele et al., 2009). Im Vergleich zu vorgefertigten Schienen, zeigen die massgefertigten Lederschienen jedoch gute Resultate bezüglich Schmerzreduktion und Betätigungsperformanz.

Ziel: Ziel war es, Lederschienen für manuell tätige Personen mit Handgelenksbeschwerden in unserer Praxis herzustellen. Dazu gehörte eine Anleitung, Schulung einiger Mitarbeitenden und Herstellung der Schienen für individuelle Patient:innenbedürfnisse und deren betätigungsorientierten Ziele.

Methodik: Eine systematische Literaturrecherche in verschiedenen Datenbanken wurde durchgeführt, um die Evidenz von massgefertigten Lederschienen bei Arthrose zu ermitteln. Zusätzlich wurde durch Austausch mit vier Ergotherapeutinnen Erfahrungswissen über die Herstellung von Lederschienen gesammelt, zusammengetragen und weiterentwickelt.

Resultat: Eine massgefertigte Lederschiene hat sich für manuell tätige Patient:innen mit anhaltenden Handgelenksschmerzen als vorteilhaft erwiesen, denn sie ist schmerzlindernd, bequem, belastbar, praktisch und ermöglicht Aktivität.

Implikation für die Praxis: Lederschienen sind für manuell tätige Patient:innen mit Handgelenksschmerzen eine gute Alternative zu vorgefertigten Schienen und können in einer handtherapeutischen Praxis mit entsprechender Anleitung preiswert hergestellt werden.

Attelle en cuir sur mesure pour les patients souffrant de douleurs au poignet exerçant une activité manuelle

**Ramona Ziörjen¹, Karin Lüthi² (¹Burgdorf;
²Zollbrück)**

Contexte: L'arthrose est la maladie articulaire la plus fréquente (Ligue suisse contre le rhumatisme,

2023) et limite en particulier les personnes exerçant une activité manuelle. Une attelle de poignet permet de les soulager. Il n'y a que peu de littérature sur les attelles de poignet en cuir fabriquées sur mesure (Haskett et al., 2004; Thiele et al., 2009). En comparaison aux attelles préfabriquées, les attelles en cuir fabriquées sur mesure montrent toutefois de bons résultats pour la réduction des douleurs et la performance dans les activités.

Objectif: L'objectif était de fabriquer des attelles en cuir sur mesure pour les personnes souffrant de douleurs au poignet exerçant une activité manuelle et prises en charge dans notre cabinet. Il s'agissait de donner des instructions, de former quelques collaborateurs et de fabriquer des attelles adaptées aux besoins individuels des patients et à leurs objectifs orientés sur les occupations.

Méthode: Une revue systématique de la littérature a été menée dans différentes bases de données afin de rassembler des preuves quant à l'utilisation d'attelles en cuir fabriquées sur mesure en cas d'arthrose. De plus, des échanges avec quatre ergothérapeutes ont permis de collecter, rassembler et développer des connaissances empiriques sur la fabrication d'attelles en cuir.

Résultats: Une attelle en cuir fabriquée sur mesure s'est avérée bénéfique pour les patients souffrant de douleurs persistantes au poignet exerçant une activité manuelle car elle soulage la douleur, est confortable, résistante, pratique et permet d'être actif.

Pertinence pratique: Les attelles en cuir sont une bonne alternative aux attelles préfabriquées pour les patients souffrant de douleurs au poignet exerçant une activité manuelle. Elles peuvent être fabriquées à moindre frais dans un cabinet de thérapie de la main grâce aux instructions appropriées.

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FM77

3D printing and hand rehabilitation: our experience

Francesca Ferrario¹, Marco Guidi², Susanna Pagella¹, Mario Gaetano Fioretti¹ (¹Lugano; ²Gravesano)

Introduction: Three-dimensional (3D) printing is a relatively new and quickly growing method of manufacturing in healthcare (1). This technology gives hand therapists a remarkable tool to make “in-house” assistive devices, hand exercise equipment, therapy tools, orthotic components, medical tools and more. Considering the described advantages of this technology we decided to use it in our practice.

3D printing involves acquisition, preparation and printing, whereby materials are joined, layer by layer to manufacture 3D-printed model.

Objective: 3D printing is a cost-effective technology that can replicate commercially available items or customize new ones. The increasingly lower cost of 3D printing materials and the absence of the need to monitor the 3D printer during printing means that this technology can be successfully integrated into clinical practice(2).

The ease customization and ability to locate various online design options further enables client-centered practice.

Method: We design and print ten therapeutic aids, such as instruments for proprioception , hand strengthening and dexterity.

For patient education, we print 3D printable upper limb bones. Once printed, the bones can be articulated to simulate joint motion. For further patient education, other materials can be added to the bone anatomy model to show the anatomy and kinesiology of muscles, tendons, and nerves.

The material that we use is Polylacticacid (PLA) which is the most popular material in the 3D printing due to its biodegradability and low-toxicity, with fused deposition modeling (FDM).

Discussion: In our opinion, the benefits of 3D printing are the replicability of 3D printed devices that provides quick and easy access for therapists and patients. In particular 3D printed devices can be custom made for a patient based on their individual need and it is feasible for a therapist to learn how to use a 3D printer with minimal training and instructions.

There are also limitations in using 3d printing such as the need for a dedicated print area because some materials creates mild toxic fumes while printing as ABS. In addition some materials are non-biodegradable and some technologies and materials still requires very expensive printers.

Dodziuk, 2016.

Hunzeker&Ozelie, 2021.

FM78

Die Rolle der Handtherapie beim 3D-Druck von Schienen im Akutspital

Christa Wyss¹, Christa Wyss¹, Christina Furthmüller¹, Lorena Schrepfer¹ (¹Basel)

Thema: Schienen gehören seit jeher zum Fachgebiet der Ergo- und Handtherapie und werden individuell an den Patienten angepasst. In den letzten Jahren hat sich die Technologie des 3D-Drucks stetig weiterentwickelt und ermöglicht auch die Herstellung von Handorthesen. In diesem Vortrag soll es um die Frage gehen, ob diese Möglichkeit auch im Akutspital eingesetzt werden kann und welche Rolle die Handtherapie dabei spielt. Dafür werden die Erkenntnisse einer bereits publizierten Studie herangezogen.

Eine perfekt angepasste Schiene kann zu einem höheren Tragekomfort und einer besseren Compliance führen. In einer randomisierten Studie wurden 3D-gedruckte Schienen mit konventionell angepassten thermoplastischen Schienen verglichen. Ziel dieser Pilotstudie war es, zu untersuchen, ob die Herstellung von Schienen mittels 3D-Druck auch im klinischen Umfeld erfolgreich durchgeführt werden kann.

Durchführung: Die Handtherapeut*innen hatten die Aufgabe, ihr fundiertes Wissen zum Schienenaufbau an die Studienärztin weiterzugeben. Sie hatten eine verantwortliche Rolle bei der Erstellung eines neuen Prozesses zum 3D-Druck; sie waren involviert in die interdisziplinäre Aufbietung der Patient*innen, den 3D-Scan der Hand, das Anpassen der vorbereiteten Schienen und die Erhebung von Daten.

Die Studie umfasste 20 Patient*innen (10 Kontrollgruppe/10 Interventionsgruppe), die eine Schiene für mindestens 4 Wochen tragen mussten, wobei das Schienenformat nicht relevant war. Der Komfort und die Zufriedenheit der Patient*innen wurden mit Hilfe eines Fragebogens bewertet, der während der Anpassung der Schiene sowie zwei Wochen und vier bis sechs Wochen später von der Handtherapie durchgeführt wurde. Schliesslich

wurde die Anwendung im klinischen Umfeld und die möglichen Vorteile des 3D-Druckverfahrens evaluiert.

Ergebnis: Schienenherstellung mittels 3D-Druck ist im Akutspital möglich. Das spitalinterne Vorgehen kann noch verbessert werden. Die Handtherapeut*innen hat im Prozess des 3D-Schienendrucks eine zentrale Aufgabe. Sie könnte jedoch in einem zukünftig implementierten Prozess noch mehr Verantwortung übernehmen.

Die Patientenzufriedenheit war in beiden Gruppen auf einem hohen Niveau.

Weitere Themen, die in aufbauender Forschung beleuchtet werden sollten, sind PROMs (Patient-related Outcome Measures), funktionelle Outcomes und eine Kosten-Nutzen-Analyse.

Le rôle de la rééducation de la main dans l'impression 3D d'attelles en hôpital de soins aigus

Christa Wyss¹, Christa Wyss¹, Christina Furthmüller¹, Lorena Schrepfer¹ (¹Bâle)

Thème: Les attelles font depuis toujours partie de la spécialité de l'ergothérapie et de la thérapie de la main et sont adaptées de manière individuelle aux patients. Ces dernières années, la technologie par impression 3D n'a cessé de se développer et permet également la confection d'orthèses de la main. Lors de cette présentation, il s'agira de savoir si cette possibilité peut également être utilisée en hôpital de soins aigus et quel rôle la thérapie de la main y joue. Pour ce faire, nous nous appuierons sur les conclusions d'une étude déjà publiée.

Une attelle parfaitement ajustée peut améliorer le confort du port et conduire à une meilleure compliance. Lors d'une étude randomisée, des attelles imprimées en 3D ont été comparées à des attelles thermoplastiques fabriquées de manière conventionnelle. L'objectif de cette étude pilote était de savoir si la fabrication d'attelles par impression 3D pouvait également être réalisée avec succès dans un environnement clinique.

Réalisation: Les thérapeutes de la main ont été chargés de transmettre leurs connaissances approfondies sur la confection d'attelles au médecin de l'étude. Ils avaient un rôle important dans la création d'un nouveau processus d'impression 3D grâce à leur implication dans la convocation interdisciplinaire des patients, le scan 3D de la main, l'adaptation des attelles confectionnées et la collecte de données.

L'étude a été menée sur 20 patients (10 dans le groupe contrôle/10 dans le groupe d'intervention) qui devaient porter une attelle pendant au moins quatre semaines et pour lesquels le format de l'attelle n'avait pas d'importance. Le confort et la satisfaction des patients ont été évalués à l'aide d'un questionnaire administré durant la confection de l'attelle, puis deux semaines et quatre à six semaines plus tard par le thérapeute de la main. Finalement, l'application dans un contexte clinique et les possibles avantages du procédé par impression 3D ont été évalués.

Résultats: La confection d'attelles par impression 3D est possible dans un hôpital de soins aigus. La procédure interne à l'hôpital peut encore être améliorée. Les thérapeutes de la main jouent un rôle central dans le processus d'impression d'attelles en 3D. Ils pourraient toutefois assumer davantage de responsabilités dans un processus qui serait implanté à l'avenir.

La satisfaction des patients était d'un niveau élevé dans les deux groupes.

Les PROMs (Patient-related Outcome Measures), les résultats fonctionnels et l'analyse coûts-bénéfices sont d'autres thèmes qui devraient être mis en lumière dans le cadre de recherches complémentaires.

FM79 Athletes-Centered: splint creativity in sports hand rehabilitation.

Gaetano Mario Fioretti¹, Susanna Pagella², Francesca Ferrario², Marco Marano³ (¹Lugano; ²6900 Lugano; ³6928 Manno)

Background: Approximately 25 % of all sports-related injuries involve the hand or wrist. Due to the high level of physical demand for function, athletes represent a unique subset of the population.¹

Rehabilitation of athletes is particular because the type of injury has both physical and psychological aspects.²

For Europe, according to a study³ based on the year 2018 in Germany (EU Injury Database) at the epidemiological level, hand and wrist injuries are more frequent for: sports without a bat (31%), cycling (28%), equestrian sports (13%), winter sports (7%) and martial arts (6%).

In most cases athletes need standard splints for the period of immobilization or protection. There are exceptions where the splint is not standardly available on the market or the hand therapist is

required to invent splints adapted to the individual and functional needs of the athlete while having to maintain the same safety standards.

Method: The new paradigm of evidence-based practice (EBP)⁴ puts the patient at the center of the discussion along with the practitioner's experience and skill and the integration of the best clinical evidence. Therapist creativity, scientific evidence, sports physician experience and athlete-centered approach become the key to success.

We provide 5 case reports with 4 innovative patient-centered splints design. We assess the VAS score before and after the wearing of the splint in a training setting and the PSQ-18 score to assess their satisfaction of the splint and the taking care part.

Results: The active protective splints proposed were a compensatory tool to achieve an early return working both to functional and psychological aspects.

The proposed splints resulted in athletes returning to sport as early as hoped. The functional results shows a decrease in pain about 70% in VAS score and an the highest level of patient satisfaction assessed with the PSQ-18 score. Consequently with the splints the athletes received custom rehabilitation programs.

Discussion: Careful multidisciplinary assessment, transparent exchange of information, and active listening to the athlete makes it possible to identify the best effective and safe solution. This presentation is a personal experience opinion aimed at suggesting new splint's options and designs and stimulating constructive discussions.

Avery III et al, 2016

Lucchetti R., Pegoli L., Bain G.I., 2018

Stogner et al., 2020

Guyatt G.H., Rennie D., 2002

Workshops SGHR Ateliers SSRM

Workshop A

The Thumb Loop»: Eine Orficast Schiene, die den schmerzenden Daumen unterstützt

Marie-Ange Schneiders Spring (Lausanne)

Seit einigen Jahren fertigen wir in der Handtherapie gerne einen einfachen Daumen-Loop in Orficast an. Unsere Zielgruppen sind hauptsächlich Patienten, die einen Kompromiss zwischen der Daumenschiene und völliger Bewegungsfreiheit brauchen. Wir bitten diese Lösung je nach Patientenbedürfnissen an.

Der Vorteil der Schiene ist, dass sie gut von den Patienten akzeptiert wird und dass sie leicht in einer 30-minütigen Therapiesitzung anzufertigen ist, da man nur 10 Minuten braucht.

Der Daumen-Loop kann aber keine Daumenschiene oder CMC-Push Schiene ersetzen.

Der Daumen-Loop bietet eine optimale Ergänzung zu den gängigen Schienen und Tapes der Daumengelenke an.

The Thumb Loop“: Une orthèse en Orficast qui soutient le pouce douloureux

Marie-Ange Schneiders Spring (Lausanne)

Depuis quelques années, nous fabriquons en thérapie de la main un Loop (boucle) de pouce en Orficast. Nos patients cibles sont principalement des patients, qui ont besoin d'un compromis entre l'attelle de pouce et une liberté de mouvement totale. Nous proposons cette solution en fonction des besoins du patient.

L'avantage de l'attelle est, qu'elle est bien acceptée par les patients et qu'elle est facile à fabriquer pendant une séance de thérapie de 30 minutes car on a besoin d'environ 10 minutes seulement.

Le Loop du pouce ne peut toutefois pas remplacer une attelle de pouce ou une attelle CMC-Push.

Le loop du pouce constitue un complément optimal aux attelles et bandes courantes qui soutiennent les articulations du pouce.



Workshop B

Medical Flossing in der Handtherapie

Nicole Plüss-Grünert, Susanne Habelt (St. Gallen)

In diesem Workshop werden die Wirkungsweise des Medical Flossing, sowie deren praktische Anwendung vorgestellt.

Medical Flossing ist eine neuere Technik, die ursprünglich aus dem Spitzensport kommt. Erst in den letzten Jahren hat sie Einzug gehalten in die medizinischen Therapien, auch in die Handtherapie. Mit dem Medical Flossing kann eine Schmerzlinderung sowie Verbesserung der Beweglichkeit erzielt werden. Durch diese konservative Therapie werden Regenerations- und Reparaturmechanismen angeregt.

Das Medical Flossing hat einen wesentlichen Einfluss auf den Stoffwechsel. Verantwortlich sind dafür vor allem drei Wirkungsmechanismen: den Effekt durch den alternierenden Druck auf das Gewebe bzw. Schwammeffekt, die kohäsive Kraft des Bandes gegenüber der Hautoberfläche und die Gate Control. Diese Mechanismen werden erläutert.

Anhand einer Studie, durchgeführt an 30 Probanden wird gezeigt, welchen Effekt eine 2 oder 3malige Repetition des Vorgangs hat, im Hinblick auf Schmerzreduktion, Bewegungsumfang und Kraft. Besonders interessant war auch die Qualität der Beweglichkeit, welche sich ebenfalls deutlich verbessert hatte. Der follow up nach einem Jahr zeigt eine erfreuliche Langzeitwirkung.

Nach grundsätzlichen Überlegungen zum Medical Flossing in der Handtherapie erfolgen praktische Anleitungen, wie das Band bei verschiedenen Krankheitsbildern angelegt wird. Schwerpunkt werden die Rhizarthrose, Fingerarthrosen, sowie Radiusfrakturen sein.

Workshop B

Medical flossing en rééducation de la main

Nicole Plüss-Grünert, Susanne Habelt (St. Gallen)

Cet atelier présentera les principes de fonctionnement ainsi que l'application pratique du medical flossing.

Le medical flossing est une technique récente, issue à l'origine du sport de haut niveau. Ce n'est que ces dernières années qu'il a fait son entrée dans les thérapies médicales, y compris dans la thérapie de la main. Le medical flossing aide à soulager la douleur et à améliorer la mobilité. Ce traitement conservateur permet de stimuler les mécanismes de régénération et de réparation.

Le medical flossing a une influence essentielle sur le métabolisme. Trois mécanismes d'action en sont principalement responsables : l'effet dû à la pression alternée sur les tissus ou effet éponge, la force cohésive de la bande par rapport à la surface cutanée et le gate control. Ces mécanismes seront expliqués.

Une étude menée sur 30 participants a montré les effets d'une répétition de la procédure deux ou trois fois sur la réduction de la douleur, l'amplitude des mouvements et la force. Il était également particulièrement intéressant de voir une nette amélioration de la qualité du mouvement. Le suivi après une année a attesté d'effets à long terme réjouissants.

Après une réflexion approfondie sur l'utilisation du medical flossing en thérapie de la main, des instructions pratiques seront données sur la manière dont la bande peut être appliquée lors de différentes pathologies. L'accent sera mis sur la rhizarthrose, l'arthrose des doigts ainsi que les fractures du radius.

Beugesehnenverletzungen. Dabei kann das Material von rigide zu semi-rigide und elastisch variieren.

Der Workshop gibt einen Überblick über die Einsatzmöglichkeiten von Relative Motion Schienen. Diese Schienen bieten eine sichere Methode, die im Alltag der Therapeuten schnell, einfach und kostengünstig eingesetzt werden kann. Dabei zeigt der Workshop Indikationen, biomechanische Überlegungen und praktische Herstellungstipps auf. Zwei unterschiedliche Schienenmodelle werden angefertigt. Literaturhinweise ergänzen die praktische Expertise.

L'attelle Relative Motion : petit, fin et efficace !

La confection de l'attelle Relative Motion a été développée à l'origine pour protéger les sutures des tendons extenseurs tout en permettant une fonction maximale de la main. Aujourd'hui, cette attelle est utilisée pour de nombreuses raisons telles que l'obtention d'une plus grande mobilité lors d'un enraideissement, le soulagement des tissus surchargés ou inflammés ou encore les lésions des tendons fléchisseurs. Pour ce faire, le matériau peut varier de rigide à semi-rigide et élastique.

L'atelier donne un aperçu des possibilités d'utilisation des attelles Relative Motion. Ces attelles offrent une méthode sûre que les thérapeutes peuvent intégrer au quotidien de manière rapide, simple et peu coûteuse. A cet égard, l'atelier présente les indications, les considérations biomécaniques et les conseils pratiques de fabrication. Deux différents modèles d'attelles seront confectionnés. Des références bibliographiques complèteront l'expertise pratique.

Workshop C

Die Relative Motion Schiene: klein, fein und effizient!

Die Herstellung der Relative Motion Schiene war ursprünglich entwickelt worden, um Strecksehnennähte zu schützen und dennoch maximale Handfunktion zuzulassen. Heutzutage findet die Schiene vielfältige Einsatzmöglichkeiten wie dem Auftrainieren von mehr Mobilität bei Steifigkeit, Entlastung von überlastetem oder entzündetem Gewebe bis hin zu

Poster SGH Posters SSCM

P1

A new finger 3D printed tubular dressing applicator for finger wounds

Marco Guidi¹, Susanna Pagella¹, Mario Gaetano Fioretti¹, Francesca Ferrario¹, Pamela Pasta¹, Ivan Tami¹ (¹Gravesano)

Introduction: Due to the lack of adaptability of existing tubular gauze applicators for digital wounds, a user-friendly device was developed to fit different finger sizes and reduce the time of bandaging for the healthcare professional and for the patient.

Methods: The device consists of two separate 3D printed parts. The device itself, designed as a tripod, and the plunger. The plunger is inserted into the main part. The plunger can be moved to several positions with a progressive change of the diameter of the tripod. We used this device in 58 patients with finger injuries. Patients with digital re-implants were excluded. Patients with multidigital injuries were included in the study.

Results: In all patients, the TRIpod was useful and speeded up the application of the tubular bandages. After a brief introduction, each patient was able to perform the daily dressing change independently. The mean time of dressing was 15 seconds.

Conclusions: TRIpod is an ergonomic and adaptable bandage aid that is easy to use for both medical professionals and the patients themselves. The advantage of the 3D printing makes the applicator a tool with potentially wide spread



Upper part of the device

P2

Minimally Invasive Arthroscopic Pisotriquetral Arthrodesis: Our First Promising Steps

Kaspars Silins¹, Esther Vögelin¹, Dominique Merky¹ (¹Bern)

Pisotriquetral (PT) instability and consecutive arthritis is a common differential diagnosis of an ulnar sided wrist pain. When conservative treatment fails, a pisiformectomy remains as the treatment of choice. Pistotriquetral arthrodesis as an alternative was described in 2006 for high demand patients. Thus far an arthroscopic approach to PT joint has been described and a case report has been published regarding an arthroscopic resection of a loose body of PT joint.

We present a case series of 3 well documented arthroscopic assisted PT arthrodesis that we performed from April 2022 till January 2023.

A 20-year-old MMA fighter presented with ulnar sided wrist pain in motion due to instability of both PT-joints. We performed an arthroscopic assisted PT-fusion with two cannulated screws. A cock-up wrist splint was given for 6 weeks. A CT-scan was preformed 6 and 12 weeks postoperatively. After 3 months a consolidation of PT-fusion was seen and the patient was allowed to strengthen his hand. After 5 months he could return to performing martial arts.

A 45-year-old office worker presented with ulnar sided wrist pain which was incapacitating her right hand. An arthroscopic-assisted PT-fusion was performed after diagnostic infiltration. 3 months postoperatively advanced consolidation was to be seen in CT-Scan with merely pain of the scar.



Lateral side of the device

Both patients reported a significant reduction of pain without loss of strength.

Arthroscopic assisted PT-arthrodesis offer a safe and minimally invasive procedure to address a symptomatic instability and arthritis of the PT-joint. Wrist arthroscopy is a mighty tool in the arsenal of a hand surgeon and this procedure enhances the spectrum of minimal invasive procedures of carpal surgery. Literature also suggests higher satisfaction rates with patients preferring an arthroscopic procedure versus open surgery. This helps us as surgeons to provide broader spectrum of minimally invasive surgical procedures with increased satisfaction of patients, good outcome results and low complication rates.

P3

Entrapment of the deep ulnar motor branch in Guyon's canal due to ganglion cyst: two case reports

Joëlle V. Hüppi¹, Marcel Schnell¹, Nadja Zechmann-Müller¹ (¹Winterthur)

Introduction: Isolated compression of the deep ulnar motor branch is uncommon. Muscular atrophy of the hypothenar, as well as reduced force in abduction of the fingers and positive Froment sign are typical clinical symptoms, whereas cutaneous innervation of the hand is not affected. Causative factors can be fracture of the hamate's hook, diseases of neighboring vessels, degenerative diseases in the wrist, or as in our cases a ganglion cyst. We will describe two cases with its clinical, neurophysiological and radiological findings, as well as its therapies applied.

Material and Methods: Two elderly people presented in our clinical outpatient department for hand surgery based on progressive loss of strength of their hand. Additionally, we could observe atrophy of the first webspace and the hypothenar area, as well as positive Froment sign. Neurophysiological studies showed distal injury of the Ramus profundus Nervus ulnaris. Radiographic examination with magnetic resonance imaging (MRI) was initiated. Both cases presented cystic formation compressing the deep branch of the ulnar nerve against the hamulus of the hamate. Furthermore, edema of denervation of the intrinsic muscles was observed. In a synopsis of the present findings, surgical decompression of the nerve at Guyon's canal was indicated.

Results: Intraoperative findings were congruent with previous MRI examination. In both cases, the deep ulnar motor branch was compressed by a

tumor in the piso-hamate hiatus. Histological investigation confirmed the presence of a ganglion cyst in both cases. After having performed the operation, both patients improved in their motor function of the ulnar nerve, whereas no sign of recurrence have been observed.

Discussion: Heavy compression of the motor branch of the ulnar nerve is of significant limitation in hand function. Therefore, patients with a decrease in hand strength should undergo further diagnostics such as neurophysiological and radiological studies. Even though, compression by a ganglion cyst in the Guyon's canal is a rare condition, one should think about when examining patients with pure motoric ulnar nerve deficit. If these conditions are existing, early decompression is recommended to achieve best outcome with high probability of rehabilitation.

P4

Posttraumatic metacarpal fractures, after uncemented MOTEC® total wrist arthroplasty: a case report

Laurène Niederhauser¹ (¹Meyrin)

The Motec® wrist prosthesis is a cementless, modular, metal-on-metal wrist arthroplasty. Threaded stems are used to achieve immediate primary fixation in the cortical bone at two-thirds of the proximal length. Coating stems with Bonit® enables long-term implant fixation and osseous integration.

In case of a third metacarpal fracture occurring in a traumatic context, internal fixation may be limited by the restricted space available due to the stem prosthesis. Solid internal fixation for early rehabilitation may help reduce secondary stiffness and impacts on wrist prosthesis function.

A 65-year-old right-handed nurse presented following a fall onto her left hand, 2 years after wrist prosthesis implantation. She had undergone a Motec® total wrist arthroplasty after a failed proximal row carpectomy. At the two-year follow-up, she reported complete pain relief and an improved range of motion with a gain in grip strength. Radiological imaging did not show any complications.

Two years post prosthesis implant, patient presented following a fall. Imaging showed short oblique fractures of 3rd, 4th and 5th metacarpals (Fig 1A/B). Internal fixation used locking T-plate 2.0 at 3rd metacarpal, 1.0 wire cerclages at the distal epiphysis to secure the plate to the diaphysis (Fig

1C). Solid fixation ensured without malrotation. Immediate rehabilitation was initiated with buddy taping, with 4 weeks protective wrist free splint, 2-week night splint. Bony fusion was achieved at 3 months; hardware removed 7 months later.

At 2-year follow-up: wrist flexion: 80°, extension: 50°, radial deviation 20°, ulnar deviation 40° with a stable pain-free wrist. Metacarpophalangeal joint motion: flexion: 110°, extension: 0°. Grip strength: 20 kg.

Fixing a fracture at the metacarpal stem of a prosthetic implant remains a technical challenge, requiring a solid fixation to enable early rehabilitation and prevent stiffness or damage to the wrist prosthesis.



Fig. 1A
Figure 1A Metacarpal fractures (fluoroscopy)

Fig. 1B
Figure 1B 3rd Metacarpal Fracture (CT)

Fig. 1C
Figure 1C Internal fixation (X-Ray post-op)

Image 1.png

P5 Syncopes and Surgery

Judith Döringer¹, Esther Vögelin¹, Roland Giger¹, Ramin Ipaktschi¹ (Bern)

A 65-year-old patient presented at the emergency department after experiencing a syncope with prolonged period of impaired consciousness thereafter. The anamnesis was devoid of similar incidents. On examination a tumor in the left submandibular region stood out. The medical history revealed this tumor being present since 4 years, growing slowly and having been verified as a schwannoma through fine needle biopsy three months before. The patient reported lightheadedness with head reclusion and a feeling of pressure when turning his head to the left. Having eliminated other probable causes for the syncope, compression of the bulbus carotis by the tumor, depending on position of the head, was diagnosed. The patient was operated and a tumor of 4,5x4x2,5cm, originating from the sympathetic trunk, was removed. The histologic examination confirmed the tumor as being a schwannoma. The patient experienced prompt relief of the disabling neurological symptoms and exhibited only mild miosis and ptosis postoperatively.

P6

Patience is Power: Positive Response to Conservative Treatment in Early-Stage Capitate Necrosis

Prisca Alt¹, Marcel Schnell¹, Nadja Zechmann-Müller¹ (Winterthur)

Introduction: Capitate necrosis is a rare condition characterized by sclerosis, fragmentation, and cyst formation in radiographic imaging. Patients present with chronic wrist pain and limited joint function. The cause is multifactorial. There are no guidelines for treatment of capitate necrosis, but surgery is commonly offered to patients. This case study presents the incidental finding of early-stage capitate necrosis in the proximal pole of a 21-year-old patient classified Milliez Type 1a during follow-up X-rays after a scaphoid fracture sustained in a fall.

Hypothesis: We hypothesize that conservative treatment, involving reduced weightbearing and close monitoring, may effectively heal early-stage capitate necrosis, leading to restored osteointegration and joint function.

Methods: A comprehensive assessment, radiographic imaging such as X-rays, CT scan, and specific perfusion MRI was performed. During the 7 months follow-up X-ray after conservative treatment of the scaphoid fracture, the capitate necrosis was diagnosed incidentally, which was defined as time zero. The latest follow-up occurred after 1.5 years. Follow-ups included repeated radiographic imaging and clinical evaluation of wrist flexion-extension and grip strength.

Results: Conservative treatment of capitate necrosis in the proximal pole resulted in sufficient healing with no signs of progression, while maintaining continuous perfusion. At the latest follow-up, the patient presented pain-free, regained full wrist joint function in flexion-extension (75-0-60°) and grip strength (Jamar II 45kg). Radiographic findings showed osseous reintegration.

Discussion: The present clinical course highlights the importance of early detection and power of conservative treatment strategies for early-stage capitate necrosis without osteoarthritic signs and with preserved perfusion. Due to the limited number of reported cases in the literature, guidelines for staging and therapeutic approaches are currently lacking. Surgical intervention is typically considered for capitate necrosis; however, taking into account the staged therapy of lunate necrosis, we recommend conservative treatment as

a viable option in early-stage cases of capitate necrosis, reducing the need for surgery and associated risks. Specific perfusion MRI protocols may help in decision-making. Long-term follow-up is crucial to assess the success of the treatment outcomes and potential complications.

P7

Mucor osteomyelitis after traumatic forearm amputation in a 38-year-old patient

Dominik Spühler¹, Johannes Fuchs¹, Jörg Hainich¹ (Sankt Gallen)

Abstract: We report the case of a forest ranger who developed a polymicrobial infection with Mucor circinelloides after traumatic forearm amputation. Based on our case report we discuss epidemiology and management of this rare and potentially fatal infection.

Introduction: Most commonly fungal osteomyelitis is associated with aspergillus or candida species. Osteomyelitis with mucor species is a rare and exceptionally life-threatening condition as mucor spores cause angioinvasive infections in patients with immunosuppressive conditions such as poorly controlled diabetes mellitus, malignancies, neutropenia, transplants, and chronic renal failure. Mucor osteomyelitis is most commonly associated with trauma or a surgical intervention. A hematogenous spread causing osteomyelitis is extremely rare. There is a male-to-female ratio of > 2:1 in Mucormycosis of bones and joints.

Case presentation: A 38-year-old Patient was transported to our emergency department by air ambulance after accidental traumatic forearm amputation. During replantation, multiple samples for microbiological testing were taken. On day 7 after replantation the patient developed progressive swelling, increasing skin necrosis, and venous congestion. An emergent re-exploration took place. Intraoperatively multiple thrombosis of all blood vessels was demonstrated with avital extensor and flexor muscles with visible superficial fungal contamination. Eventually the decision had to be taken to amputate at the level of the proximal forearm. The microbiological and histological bone samples revealed polymicrobial infection with Mucor circinelloides. Systemic additional antifungal therapy was implemented. Repeated surgical debridement were performed over the following 14 days. Eventually closure of the skin defect by a fasciocutaneous hatchet flap and

meshed skin graft took place 5 weeks after the initial trauma.

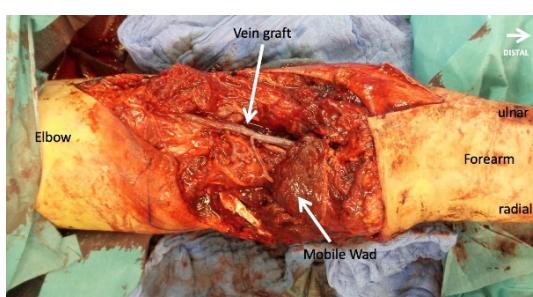
Discussion: As Mucormycosis infections are exceptionally rare and potentially lethal, a multidisciplinary approach is mandatory. Early diagnosis, a combination of antifungal therapy and aggressive serial debridement as well as treatment of underlying medical conditions such as diabetes mellitus are mandatory. Early differentiation between colonization and invasiveness can reduce side effects by shortening the time of treatment with antifungal agents as colonization can be treated additionally with local antiseptics.



Infection.jpg



Forearm.jpg



Replantation.jpg

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Unusual giant cell tumor of the tendon sheath invading the dorsal capsule of the wrist.

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Giant cell tumor of the tendon sheath is the second most common soft tissue tumor of the hand after ganglion cysts. However it is most commonly located in digits as a painless, slow-growing mass on the volar surface of fingers.

Dorsal masses to the wrist are usually caused by arthrosynovial cysts. We hereby present an unusual case of giant cell tumor of the tendon sheaths appearing on the dorsum of the carpus. A 28-year old woman presented to our hand center with a history of a mass on the dorsum of her wrist present for several years but growing since 9 months. The mass was located between the 4th and 5th compartments. It was painless, with a hard consistence and mobile towards deep and superficial layers. MRI showed a mass of 31 x 7 x 22mm forcing back the extensor tendons leaving a footprint on the carpal bones without cortical lysis invading the dorsal capsule of the wrist. It extended from the dorsum of the trapezoid, capitatum, hamatum and lunatum with extrinsic compression of the dorsal cortex of the capitate.

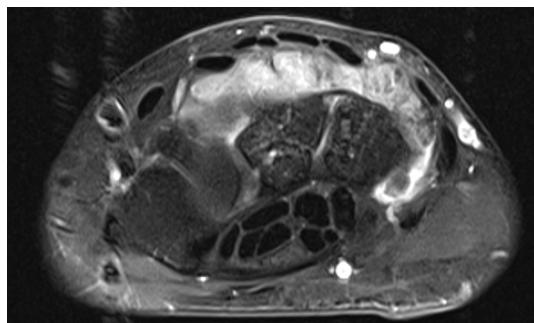
The patient underwent surgical excision of the mass with the whole dorsal capsule of the wrist including the dorsal intercarpal ligament (DIC) and dorsal radiotriquetral ligament (DRC). Histopathology confirmed the diagnosis. The DIC and DRC were not reconstructed for fear of bony invasion of the tumor. The patient was immobilized in a forearm cast for 1 month after surgery.

Despite some stiffness in her wrist with a flexion-extension of 35°-0-55°, she resumed all her activities 6 months after surgery including high intensity sport (crossfit). The control MRI did not show any recurrence up to date (1 year, 9 months).

Those unusual cases pose a challenge to the surgical team, having to choose between potential instability or risk of bony invasion. In our case, the patient evolved very favorably and this might help other colleagues who encounter the same challenge.



Fig_2_Tumor excision.jpg



Fig_1_MRI.PNG



Fig_3_Excision of the DIC and DRC.jpg

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HandsON- international cooperation for hand surgery in the South Pacific- presentation and review

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Background: With partners in the National Referral Hospital in Honiara (Solomon Islands), Hand surgeons from a Swiss tertiary hospital have started a cooperation with the aim to sustainably improve hand and reconstructive surgical care in this country with a light house effect for the entire South Pacific region. The widely dispersed population of these small island states, 25% of which live below the poverty line, with significant geographical distances between the individual islands, often only reached by the simplest means

of transportation, lead to a situation with very limited medical and special surgical care, as well as major challenges and needs for support in long-term development.

Aim: The aim of this study is to report on progress since the start of an 8-module training cooperation.

Material & Methods: The dynamics of the numbers of hand surgical patients, delays from injury to referral and from initial specialist review to definitive treatment are presented since the start of the training program. Success of treatment is evaluated via pathology-specific outcome measures, and general outcomes such as complications, re-operations and secondary procedures. The data is extracted from the local Trauma and Orthopedic Database.

Results: The data extraction is still ongoing at the date of abstract submission and will be critically evaluated and presented at the time of the Annual SGH Meeting November 2023.

Conclusion: International cooperations in low and middle income countries such as HandsON need to be ongoing subject to critical evaluation in order to meet the aim to progressively and sustainably support and enable surgeons in training on site with local, national and international networking, using local infrastructure and resources, in order to guarantee sustainable change and excellence in surgical patient care. This includes the collection of all relevant data for the measurement of change and progress, and their critical evaluation including audits and research projects.