27th Scandinavian Hand Society Congress

ABSTRACT BOOK

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Table of Contents

Oral abstracts

Track: CMC joint

O-01 MAÏA TM Joint Arthroplasty: Clinical and Radiological Outcomes of 88 Prosthesis with More than 9 Years of Follow-up

Information about abstract submitter

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The main content of abstract:

Objective
Trapeziometacarpal (TMC) total joint replacement is increasingly being performed in Europe. MAÏA TMC total joint arthroplasty is a modular uncemented ball-and-socket hydroxyapatite-coated implant. This study assessed the midterm clinical and radiological results of the MAÏA TMC prosthesis.

Methods
This single-center retrospective study involved 80 patients who underwent 88 MAÏA TMC prosthesis implantations from February 2006 to April 2009, and who had a minimum of average 8,7 years' follow-up. Indications for the procedure were painful TMC joint osteoarthritis affecting activities of daily living and a failure of at least 6 months of nonsurgical treatment. Pre- and postoperative clinical and radiographic data were reviewed.

Results
Median follow-up is 100 months (range, 84-126). quick dash improved from 61.3+/- 17.1 to 17.5+/- 16 . range of motion comparable to the contralateral thumb. Kapandji Opposition score almost normal (9.2 of 10; range, 6-10). key pinch and grip strength, improved 26% and 43%, respectively. Bone complications : trapezium loosening 4 (4.2%) , dislocation 1 , trapezium fracture 4 (4.2%) . Among the 26 preoperative reducible Z-deformities, only 5 (19.2%) were not totally corrected after surgery. The procedure success, by survival analysis over average 8,7 years is 93% (95% confidence interval, 87-98).

Conclusions
MAÏA TMC total joint arthroplasty may be a reliable treatment option for TMC joint osteoarthritis, with very good results for pain relief, strength, mobility, and restoration of the thumb length, providing correction of most thumb z-deformities.

Brief description of the abstract
Retrospective study of the evolution of 88 MAIA Trapezometacarpal replacement implanted from 2006 to 2009 in one single center . Results evaluated clinically and radiologically with a median follow-up of 100 month . Trapezium complications were 4 trapezium loosening (4,2%), 3 trapezium fracture (3,1%), one dislocation . With an implant survival at 93% after an average of 8,7 years back, this technique should be considered as very reliable in the treatment of TM joint arthrosis.

O-02 RegJoint™ a novel way for rhizarthrosis treatement

Information about abstract submitter

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The main content of abstract:

Objective
There are a lot of techniques for thumb basal joint arthritis treatment (Menon`s interposition or LRTI arthroplasty, Mini TightRope® CMC Technique...) which affecting up to 11% and 33% of men and women in their 50s and 60s, respectively. RegJoint™ spacer is a better alternative than previously known techniques in the operation of rhizarthrosis, because it would shorten the time of surgery and simplify it, while improving time until complete rehabilitation, without pain and return to the workplace.

Methods
Ninety-two patients (aged 43 -81 years) were operated and analysed. In a bloodless field, at the base of the thumb, a dorsoradial longitudinal incision was performed. We created the capsular flap with the distal base over a TMC joint, following partial or complete resection of the trapezium. After that we inserted the RegJoint prosthesis and firmly closed the capsule. After 3-4 weeks of imobilisation the patients were administered to physiotherapist. We observed patients 4, 12-17 weeks and 1 year postoperatively to measure progress with x-ray control, VAS, Kapandji's 10-point functional score, Mayo wrist score and QuickDASH score.

Results
Pre- and post-operatively (after 4 weeks, 3 and 12 months) we performed a quickDASH score and average measures were pre-OP 43,5 and postOP 34,5/26,4/21,3. VAS (visual analogue scale) improved from 7,1 pre-OP to 5,7/3,1/1,9 post-OP.Kapandji's functional score also improved from 4,7 point pre-OP to 5,9/8,1/9,2 point 1 year post-OP. Pre- and post-operatively we performed Mayo wrist score which improved from preOP 45 to postOP 54/69/76.X-ray controls were made to evaluate the average distance between the base of first metacarpal and the remaining trapezium/scaphoid which increase from 0,2 mm to 3,2/3,0 mm and it narrows after one year to 2,2 mm.

Conclusions
Using this technique the results are stimulative and comparable to the other comparable surgical techniques. We can perform early mobilisation and result is good clinical outcome with quite low pain and stable (well-positioned) base of first metacarpal. This technique was also a second salvage procedure after the failed first operation (Menon`s arthroplasty).

Brief description of the abstract
There are a lot of techniques for thumb basal joint arthritis, the most frequent site in the upper extremity to have need of surgery.Nowadays, we have bioabsorbable porous implant, that serves as a joint spacer in the shape of a disk between the two bone ends. The porous structure of RegJoint™ is suitable for the ingrowth of the bone and offers long standing results with excellent pain relief and appearance of operated limbs with no weight or function restrictions after rehabilitation period.

O-03 Trapeziectomy with LRTI or joint replacement for CMC1 arthritis, a randomised controlled trial

Information about abstract submitter

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The main content of abstract:

Objective
At present no one surgical treatment for symptomatic CMC1 arthritis has been proven superior to

another. The objective of this RCT was to compare Trapeziectomy with LRTI to an uncemented joint replacement (the Elektra™). Our hypothesis was that the joint replacement would be superior as measured by the Quick DASH (QDASH) at two years. Secondary outcome measures were the NELSON score, the strength of grip-,key pinch- and tip pinch, range of abduction and extension and the Kapandji opposition score. Complications were also registered.

Methods
40 patients were randomised (20 in each group). Inclusion was from 2008 to 2016. We included adult patients with good general health and symptomatic CMC1 arthritis. Concomitant STT arthritis or large trapezial cysts (as assessed by CT scan) were exclusion criteria as well as language problems, other factors prohibiting follow-up over 2 years and pregnancy. The procedures were done by a single surgeon as day surgery. Both groups received 6 weeks of cast treatment. Follow ups were at 3,6,12 and 24 months. Patient and surgeon were not blinded, but physiotherapists blinded to the procedure performed the scoring of patients at 1 and 2 years.

Results
Median age was 61 (36-77) and 64 (55-72) for the trapeziectomy and prostheses respectively. There was no significant difference between groups at two years in any outcome measure except range of motion (better for joint replacements). The QDASH was better in the joint replacement group, but significant only at 3 and 6 months. The pinch strength and Kapandji score was significantly better for the joint replacements at the early follow-ups. There were more complications in the joint replacement group, 5 joint replacements were revised (2 cup loosening, 1 instability, 2 likely reactions to metal wear)

Conclusions
This RCT was unable to support the hypothesis of improved function after joint replacement at two years. There were more complications after the joint replacements and our findings for the Elektra concur with others. Whether a different joint replacement can significantly outperform trapeziectomy remains to be seen from future trials, but joint replacements should be carefully monitored if used. Trapeziectomy with LRTI was a safe procedure with a few minor complications in this study.

Brief description of the abstract
We randomised 40 patients with CMC1 arthritis to trapeziectomy with LRTI or joint replacement (the Elektra). At final follow up (2 years), there was no difference in the Quick DASH, however it was significantly better for the joint replacements at 3 and 6 months. The NELSON score, strength of grip, key- and tip pinch, and the Kapandji score were also significantly better for the joint replacements at early follow up. There were more complications in the joint replacement group.

O-04 The effect of surgery for basal thumb arthritis on patient reported outcome measures – a registry based study.

Information about abstract submitter

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2) Marianne Arner, Karolinska Institutet, Sweden

The main content of abstract:

Objective
Patient rated outcome measures (PROM) before and after surgery for basal thumb joint osteoarthritis have previously not been studied in large populations. The first national healthcare quality registry for hand surgery started in Sweden in 2010 (HAKIR) and includes all operations performed at the 7 specialist departments of hand surgery in Sweden. The aim of the study was to evaluate PROM before and after surgery for basal thumb joint osteoarthritis using registry data from HAKIR and investigate the

practice of and potential differences in results after simple trapeziectomy vs. ligament reconstruction and tendon interposition (LRTI).

Methods
In HAKIR, PROM questionnaires are distributed to all operated patients preoperatively, 3 months and 1 year after surgery and include the Quick Disability of the arm, shoulder and hand form (QuickDASH) and a questionnaire (HQ-8) with 7 questions rating symptoms from 0 to 100 (on a 10 point Likert scale) in the operated hand (pain on load, pain on motion without load, pain at rest, stiffness, weakness, numbness and cold sensitivity) and one question about the ability to perform activities of daily living (ADL). PROM for 1850 patients was analyzed preoperatively and one year after trapeziectomy with or without LRTI.

Results
The mean age was 63 years and 79% of the patients were women. 46% (n=852) of the 1850 patients had completed the questionnaire preoperatively and 37% (n=683) one year after the operation. The mean pain at rest decreased from 50 to 12 and mean QuickDASH score was reduced from 56 to 26. Pain on load and weakness were still rated rather high one year postoperatively (mean 30 and 34 respectively). Trapeziectomy with LRTI was the dominant method of surgery (86%). The result was similar after trapeziectomy with LRTI and simple trapeziectomy but the latter group was small.

Conclusions
Patients should be informed that a certain degree of pain on load as well as weakness is to be expected one year after surgery for basal thumb joint osteoarthritis. Trapeziectomy with LRTI still is the predominant surgical method in Sweden despite reports that LRTI has shown no advantage over simple trapeziectomy but rather a higher risk for complications. Response rates need to be improved in HAKIR to enable high quality comparisons of surgical methods for basal thumb joint osteoarthritis.

Brief description of the abstract
The effect of surgery for basal thumb arthritis in terms of improved patient reported outcome was investigated based on data from the Swedish quality registry for hand surgery (HAKIR). Pain on load, pain on motion without load, pain at rest, stiffness, weakness, problems in daily activities and QuickDASH before and after surgery were analyzed in 1850 patients. Despite great improvement, pain on load and weakness were still rated relatively high one year postoperatively.

Track: Distal radius fracture and associted injuries

O-05 The incidence of osteoporosis in patients with distal radius fractures

Information about abstract submitter

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The main content of abstract:

Objective
Distal radius fractures are associated with low bone mineral density (BMD) and can be a preliminary indicator of osteoporosis. This fracture may also precede, and is associated with increased risk for hip fractures. Literature available shows a reported prevalence of osteoporosis of between 42.5%-50% in patients with distal radius fractures in Western countries. Singapore has a high incidence of

osteoporotic fractures. This study aims to review the incidence of osteoporosis in patients with distal radius fractures in the Asian context.

Methods
A retrospective review of information from patients in our centre with distal radius fractures was conducted. Availability of BMD tests and mechanism of injury for each patient was recorded. T-score for BMD measurements were recorded from the lumbar spine, femoral neck and total hip. The diagnosis of osteoporosis was determined either by presence of a low energy injury or according to the World Health Organisation international reference standard of a T score less than or equal to -2.5. The results were analysed by age and gender, and compared to data available in literature.

Results
There were 3529 recorded patients with distal radius fractures over a period of 4 years, from 2013-2016. 30.9% (1089 patients) had BMD scans done, of which 55.5% had a BMD scan diagnosis of osteoporosis. The incidence of osteoporosis in females was 54.3% and 62.7% in males. The mean ages of females and males with diagnosed osteoporosis were 74 years and 71 years in age respectively. 60.5% (2136 patients) had a documented history of low energy trauma. 36.3% of this group had a BMD done, of which 55% had osteoporosis on the scan.

Conclusions
The incidence of osteoporosis in patients with distal radius fractures in our centre is similar to data published in Western studies. In addition, the incidence was notably higher in patients aged 65 years and above. However, these numbers may be an underestimation as the overall rate of BMDs was 30.9%. We advocate that BMD scans be done in all low energy trauma distal radius fractures, especially in patients aged 65 and above to facilitate early detection, treatment, and prevention of further osteoporotic complications.

Brief description of the abstract
Distal radius fractures are associated with low bone mineral density. We reviewed the incidence of osteoporosis in patients with distal radius fractures in the Asian context. A retrospective review of patients in our centre with distal radius fractures was conducted. 55.5% of 3529 recorded patients with distal radius fractures had a BMD scan diagnosis of osteoporosis. 60.5% had a documented history of low energy trauma. We recommend BMD screening for all low energy distal radius fractures.

Track: Elbow and forearm

O-06 The Treatment of Lateral Epicondylitis with Platelet Rich Plasma or autologous blood — A Randomized Placebo-controlled Double-Blind Trial

Information about abstract submitter

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2) Teemu Karjalainen, Monash Department of Clinical Epidemiology, Cabrini Institute and Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University, Australia
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5) Janne Lehtinen, Tampere University Hospital, Finland

The main content of abstract:

Objective
Currently, there is no evidence that any treatment, including surgery, is better than placebo or no

treatment in management of lateral epicondylitis (LE). Platelet rich plasma (PRP) and autologous blood (AB) have been suggested as a potential therapy for LE showing promising results in animal tendon injury models and initial clinical series. However, after initial excitement, the role of PRP and AB injections in the management of LE remains unclear. The purpose of this study was to compare the effects of PRP, AB and saline vehicle on the natural course of LE.

Methods
We constructed a randomised controlled double-blinded study in which included adults whose symptoms were lasted over three months and primary conservative treatment had been tried. We excluded patients with other concomitant upper limb symptoms and surgical treatment of the elbow. We injected PRP, AB or saline vehicle to the proximal insertion of the extensor carpi radialis brevis muscle in a parallel assignment model. We followed the patients at 4th, 8th, 12th, 26th, and 52nd week. The primary outcome measure was pain VAS. Secondary outcomes were DASH score and grip strength.

Results
119 patients participated to the study. 40 of them were treated with PRP, 40 with AB, and 39 with saline vehicle. At the baseline, mean of the pain VAS was 5.6 (p = 0.78). Pain VAS of the PRP group decreased during the follow up being 5.0, 4.2, 4.3, 3.9, and 2.7 at 4th, 8th, 12th, 26th, and 52nd week, respectively. Corresponding pain VAS values were 4.7, 4.1, 3.9, 3.4 and 2.1 for the AB group and 5.3, 5.1, 4.4, 4.3 and 3.0 for the saline vehicle group (p = 0.42, p = 0.15, p = 0.64, p = 0.35 and p = 0.25, respectively). Secondary outcome measurements did not differ between the groups either. No complications occurred due to injections.

Conclusions
PRP or AB did not show any advantage when compared with saline vehicle on the treatment of LE. The use of PRP or AB in treating LE should be re-evaluated. This study has been registered to ClinicalTrials.gov (Identifier NCT01851044). This study was funded by Pirkanmaa Hospital District and government research funding.

Brief description of the abstract
This study was to compare platelet rich plasma (PRP), autologous blood (AB) and saline vehicle in the treatment of lateral epicondylitis. In a double-blinded study, we randomised 119 patients to three treatment groups, injected PRP, AB or saline vehicle to the proximal insertion of the ERCB muscle and followed the patients 52 weeks. In all groups, pain VAS decreased without any significant difference between the groups. PRP or AB did not show any advantage when compared with saline vehicle.

Track: Hand and finger fractures

O-07 Retrospective follow-up of patients operated with intramedullary screw fixation of Metacarpal and Phalangeal Fractures

Information about abstract submitter

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6) Istvan Rigo, Division of Hand Surgery, Department of Orthopedics, Østfold Hospital Trust, Moss, Norway

The main content of abstract:

Objective
The purpose of this study is to evaluate objective and subjective results for patients operated with retrograde intramedullary screw fixation for metacarpal and phalangeal fractures.

Methods
Between June 2016 and February 2018, we operated fifteen patients(16 fractures) with retrograde intramedullary screw fixation for metacarpal and phalangeal fractures. We retrospectively reviewed these patients one year after surgery. At follow-up we obtained information about sex, age, type of injury, total active motion (TAM), visual analog score (VAS), disabilities of the arm, patient rate wrist and hand evaluation (PRWHE), shoulder, and hand score (Q-DASH), grip strength (JAMAR), radiographs, and return to work.

Results
The mean age of patients was 39 years. There were 13 metacarpal fractures and 3 proximal phalanges fractures. Mean time to follow-up was 14,3 months. Of the thirteen patients that met to follow up, TAM was 275°, a mean of 94% of contralateral hand. Nine patients had a few degrees of extension deficit, a mean of 17°. VAS at rest was 0, and VAS during activity was 1,5(0-6,5). PRWHE 9,1((0-29)median 5)) and Q-DASH 10,1((0-41)median 2,5)). JAMAR was 41,4 kg, a mean of 103% of contralateral hand. All fractures healed within 6 weeks. Of the twelve patients that was working, they returned to work after 22,5 days. We registered no complications.

Conclusions
Retrograde headless intramedullary screw fixation of metacarpal and phalangeal fractures is a good option for unstable fractures. It gives a stable fixation that allows early mobilization without casting, and the possibility for early return to work.

O-08 Paradigm shift: Treat the imminent stiffness and not the fracture

Information about abstract submitter

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The main content of abstract:

Objective
There are two principal problems in hand fracture treatment. First: The concern of the patient to harm his hand restrains him to use it at all. Secondly: The spontaneous intrinsic minus position of an injured hand results in early joint stiffness. While a regular follow-up is strongly recommended in the conservative treatment of hand fractures, a secondary fracture dislocation rarely happens. Most so-called secondary dislocations result more likely from a slightly changed x-ray projection than from a repositioning of fracture fragments.

Methods
We report 27 patients with all kinds of metacarpal and phalangeal fracture treated in the Lucerne Cast (LuCa). This well-established type of a splint immobilizes the metacarpal joints in a position of flexion, leaving the more proximal and distal joints completely free. In the case of proximal metacarpal and PIP-joint-fractures, the radiocarpal and PIP-joints were partly incorporated into the LuCa, but always allowing

complete finger motion. Motion and load were completely left to the patient's convenience and were never restricted formally.

Results
The functional outcome of fracture treatment in the LuCa was at least in the short term superior to our conventional immobilization regimen which was a static splint configuration. We did not encounter any significant secondary fracture dislocation or any pseudarthrosis formation.

Conclusions
The LuCa provides physical and, perhaps more important, psychological protection of the fracture site and prevents the unwanted intrinsic minus position at the same time. Meanwhile, we are treating most of our metacarpal and finger fractures by applying a LuCa.

Brief description of the abstract
We report our hand fracture treatment in the Lucerne cast (LuCa). We thereby describe the main advantage of this treatment protocol which distracts the focus from fracture healing and put the stress on preventing the imminent stiffness, the latter representing the claimed paradigm change. Especially the treatment of elderly and disabled patient is tremendously simplified.

O-09 Improving the Outcome of Open Distal Phalangeal Fracture Treated with Kirschner Wire

Information about abstract submitter

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The main content of abstract:

Objective
Pin track infection from Kirschner wire (K-wire) insertion to treat open distal phalangeal fracture is common.This can lead to potential serious sequelae including osteomyelitis. The objective of our study were:- 1) To assess the management of open distal phalangeal fracture in our unit and compare it to the guideline provided by the British Society for Surgery of the Hand (BSSH). 2) To determine the incidence of superficial and deep infection amongst patients who had been treated with K-wire fixation in a single hand unit. 3) To devise a local protocol/guideline for the safe and appropriate use of K-wires for P3 fractures.

Methods
We reviewed the clinical notes and X-rays of all 38 adult and paediatric patients who underwent this procedure during the period of December 2016 to December 2017. Data collected were patients' demographic, mechanism of injury, length of time taken from injury to first washout, length of time K wire remains in situ, any infection recorded and microbiology reports. We have made a guideline available in theatres and trauma clinic that contains a number of recommendations for surgeons to consider before using a K-wire to treat fractures of the distal phalanx. Data was analysed by comparing the rate of infection pre and post intervention.

Results
The overall rate of infection after K-wire fixation in this patient group was 18.4% (n=7). The proportion of patients who developed osteomyelitis was 10.5% (n=4). Following the implementation of the new local guideline, the infection rate was reduced to 14%.

Conclusions
The rate of infection in this patient group is lower than in the literature and this continues to improve following the implementation of our newly-devised guideline.

Brief description of the abstract
We aimed to determine the incidence of infection amongst patients who had been treated with K-wire fixation in a single hand unit, for open distal phalangeal fracture and devise a guideline to improve the outcome. All patients who underwent this procedure between December 2016 and 2017 were included. We have made the guideline available in theatres and trauma clinic that contains a number of important points. We found that the overall patients' outcome improved following our intervention.

O-10 Corrective Osteotomies For Digital Overlap In Phalangeal And Metacarpal Fracture Malunion Under Wide Awake Local Anesthaesia

Information about abstract submitter

1) David Tan, Department of Hand and Reconstructive Microsurgery, National University Hospital Singapore*

The main content of abstract:

Objective
HYPOTHESIS Phalangeal and metacarpal malunion with digital overlap can be safely and accurately corrected by osteotomies and fixation under WALANT. INTRODUCTION The use of WALANT in surgical procedures of the hand is well described and extends to tendon surgery, carpal tunnel release, trapeziectomy and phalangeal fracture fixation. Its use however has not been described in corrective osteotomies of phalangeal or metacarpal fracture malunion.

Methods
5 patients with digital overlap (scissoring) underwent corrective osteotomies under WALANT. There were 3 male patients. Average age was 40years. There were 3 phalangeal malunions and 2 metacarpal malunions. All underwent extensor tenolysis prior. 1 with phalangeal malunion also required PIPJ arthrolysis and flexor tenolysis. 1 closing wedge osteotomy was performed and the remaining cases were treated with a derotation osteotomy. The patients were followed up till union of the osteotomy. Their follow up ranged from 3 months to 5 years and 10 months (average 16.5 months) .

Results
Correction of scissoring was achieved intra-operatively and maintained at final follow up in all patients. Preop total active motion (TAM) averaged 191 (range 140-235) and postop TAM averaged 228 (190-245). The average gain in motion was 36 (range10-70) and 22% (range 4-41) from the preop TAM. Grip strength improved in four with no change in the remaining patient. Preop grip strength averaged 12kg/F (range 4-16) and postop averaged 21kg/F (range 10-36). In 4 of the patients, complete union of the osteotomy sites was observed at final follow up. In the remaining patient, bridging callus was seen at the last follow up at 3 months.

Conclusions
Corrective osteotomies of phalangeal and metacarpal malunion under WALANT is a safe and effective means of achieving correction of scissoring. With the patient wide awake and cooperating, precise correction of rotational alignment can be ascertained. Concomitant tenolysis allows motion gains to be made over and above the restoration of rotational alignment. The use of angular stable implants and closing wedge osteotomies eliminate the need for bonegrafting and facilitate the surgical procedure under local anesthaesia.

Track: Hand therapy

O–11 Dellon's modification of Moberg´s pick-up test – Euro version – with standardized test protocol

Information about abstract submitter

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The main content of abstract:

Objective
The idea of functional sensory testing was introduced by Erik Moberg in 1950´s. He developed a pick-up test with non-specific items. A. Lee Dellon made his version of Moberg pick-up test in 1980´s by defining the items used in the test. In our studies at ARCADA, University of Applied Sciences, we realized that some dexterity tests are outdated because the test items are no longer in use in everyday life. Dellon´s version of the pick-up test lacked a standardized test protocol and original test items where difficult to find in Europe, as they originate from the USA.

Methods
We felt a need to standardize the test items in metric system, to ensure that the test items are available in Europe and cater instructions in the Finnish language. With kind permission from Dr Dellon, we started to re-write the instructions. Writing instructions, testing and peer reviews were done.

Results
The pilot study showed that therapists perceived this test as practical, quick and easy to use. 96% felt that the test instructions were clear and easy to follow. The Test kit was considered compact and easy to carry around to client appointments. The Test was commented to be relevant and it supported findings from other functionality / dexterity tests. Study was done with normal population. By the time of this congress, reliability study results will be available.

Conclusions
Dellon's modification of Moberg's pick-up test has now a standardized instruction and a test protocol with detailed instructions for testing in Finnish and English. This test can be used to evaluate and monitor fine motor skills, dexterity and prehension in part one (pick-up) and tactile gnosis in part 2 (object recognition) Collection of normative data is in the plans for the future and we welcome international co-operation for this. Test may be translated into other European languages also.

Brief description of the abstract
Functional sensory testing was introduced by Erik Moberg in 1950´s. A. Lee Dellon made his version in 1980´s. For present day, this test lacked a standardized test protocol and test items where in USA measurements. With kind permission from Dr Dellon, we wrote standardized instruction and protocol with detailed instructions in Finnish and English. Peer reviews and pilot study showed that therapists perceived this test as practical, quick and easy to use. Introduction to test will be presented.

Track: Tendons

O–12 Revision metacarpophalangeal joint extensor tendon centralisation: a new technique using junctura tendinum

Information about abstract submitter

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The main content of abstract:

Objective
To demonstrate a new point of technique for revision extensor tendon centralisation and soft tissue balance at the metacarpal phalangeal joint (MCPJ) Patient: A 60-year-old woman presented at seven weeks with recurrence of extensor tendon subluxation, ulnar deviation and palmar subluxation at the MCPJ following reconstruction of the radial sagittal band of the middle finger. After further rehabilitation the patient remained symptomatic and requested revision surgery.

Methods
A longitudinal incision was made on the radial side of the extensor digitorum communis (EDC) tendon through the attenuated radial sagittal band reefing. The joint was inspected and the capsule closed using an overlapping suture, correcting the palmar subluxation. The sagittal band reconstruction was then temporised. A juncture tendinum was identified between middle and ring EDC tendons and was harvested with a tendon slip of the ring EDC. The slip was then passed through the middle finger EDC tendon and woven through the radial sagittal band. The sagittal band was reefed. The pre-placed weave was then tensioned to achieve soft tissue balance.

Results
The juncture tendinum with proximal based partial EDC slip is a simple technique, providing high-quality local soft tissue and offers a stable, robust reconstruction without complications or donor site morbidity.

Conclusions
Revision reconstruction of the sagittal band with a juncture tendinum with proximal based partial EDC slip offers effective surgical management of the recurrent EDC subluxation.

Brief description of the abstract
Aim: To demonstrate a new point of technique for revision extensor tendon centralisation and soft tissue balance at the MCPJ. Intervention: Revision MCPJ extensor tendon centralisation using a juncture tendinum with a proximal based partial EDC slip. Results & Conclusions: The junctura tendinum with proximal based partial EDC slip is a simple technique, offers a stable reconstruction and effective surgical management of recurrent EDC subluxation, without complications or donor site morbidity.

O–13 Partially–Lacerated Digital Flexor Tendons — Determining the Intact Cross–Sectional Area and Biomechanical Analysis

Information about abstract submitter

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The main content of abstract:

Objective
The management of partially-lacerated tendons is controversial. While there are concerns regarding triggering, entrapment, and tendon ruptures in unrepaired lacerations involving greater than 50% of the tendon, previous biomechanical, animal, and clinical studies have shown that partial lacerations of up to 95% have good outcomes even without surgery. In fact, surgery may even result in worse outcomes such as adhesions, tendon weakening and rupture. Additionally, the conventional methods of determining the extent of the tendon lacerations have been proven to be unreliable and inaccurate.

Methods
We propose a new, clinically-applicable method to determine the cross-sectional area of the intact portion of a partially-lacerated tendon, using 20 specimens of cadaveric digital flexor tendons. This method requires minimal equipment, and is easily performed intra-operatively in a sterile manner in operating theatres. The results of the cross-sectional area derived using this method is correlated with a computer software to examine its accuracy. We also analyze the biomechanical properties of partially-lacerated tendons of varying intact cross-sectional areas, to determine if a threshold exists beyond which surgical repair is indicated.

Results
In partially-lacerated tendons, our proposed method of determining the remnant intact cross-sectional area, correlated well with the areas measured by a computer software. The degree of mismatch was 5.85%. Biomechanical testing of the ultimate tensile strengths (UTS) of these cadaveric tendon specimens showed that above a cross-sectional area of 5mm2, the UTS was consistently above 150N. However, there was no linear relationship between the cross-sectional area and the UTS.

Conclusions
In the intra-operative assessment of partially-lacerated digital flexor tendons, our proposed method of deriving the intact tendon cross-sectional area is accurate and applicable clinically. Cross-sectional areas of greater than 5mm2 can tolerate the tensile forces of early active mobilization against resistance.

Brief description of the abstract
The management of partially-lacerated tendons is controversial. Conventional methods of determining the extent of lacerations have additionally been proven to be inaccurate. We propose a clinically-applicable method to determine the intact tendon's cross-sectional area (CSA). This method is accurate, with an error of 5.85%. Biomechanical analysis of varying tendon CSAs shows that intact tendons more than 5mm2 can tolerate the tensile forces of early active mobilization against resistance.

Track: Wrist fractures and injuries

O-14 Conservative Treatment of AO type C Radius Fractures: A Long Term Outcome

Information about abstract submitter

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3) Heidi Vastamäki, Sports Trauma Research Unit, Hospital Mehiläinen Neo, Turku, Finland

The main content of abstract:

Objective
Aim of the study was to assess the long-term radiological and functional outcome of AO type C distal radius fractures treated non-operatively with reduction and cast immobilisation.

Methods
Patients treated during years 2010-2012 were evaluated , of which conservatively treated type C fracture was found in 140 wrists. Because of various reasons 72 patients were excluded. We investigated 68 wrists mean 6.7 years (SD0.5) after the treatment Patient-Rated Wrist evaluation (PRWE), Quick Disabilities of the Arm, Shoulder and Hand (QuickDash) scores and Visual Analogue Score (VAS) in addition to clinical evaluation with measuring wrist range of motion (ROM) and radiological outcome. The data was anlyzed using IBM SSPS Statistics (Mann-Whintey U-test and Spearmans rank correlation).

Results
Deterioration of the achieved alignment was found in 46 wrists (68%) : ≥2 mm shortening of radius compared to ulna (n=34) ,≥ 10° dorsal tilt in 27wrists and at least some step-off on the joint surface in four. No statistical significant difference was found in QDash (mean 10.3 vs 5.7, p=0.213) or PRWE (mean 8.1 vs 5.1, p=0.126). ROM was reduced in extension in 27 wrists, in flexion 29, in supination 11 and in pronation three wrists. Reduced ROM had statistical significant association with QDash (extension deficit in QDash mean 15.9 vs 5.0, p=0.037; flexion deficit in PRWE 11.5 vs 4.4, p= 0.005) as well as had supination deficit.

Conclusions
AO- C-type fractures seem to be relatively unstable. Reduction position with cast immobilisation deteriorates in more than half of the wrists. How much the deterioration affects to clinical outcome is still not clear. In our study we did not find significant association between either shortening of radius , dorsal or volar tilt of radius or incongruency of joint surface to affect Patient-Reported Outcome Measures. The remaining stiffness of wrist had association with clinical outcome.

Brief description of the abstract
This retrospective long term case series study of AO C-type radius fractures shows deterioration of achieved acceptable position in more tha half of the wrists. Still, no siqnificant association between clinical outcome (measured with QDash and PRWE) and radiological malalignment was found. Some association inbetween remained stiffness (compared to the contralateral side) and clinical outcome was found.

O-15 Prospective results after 4CF for SLAC and SNAC in 30 wrists, minimum 1 year follow-up

Information about abstract submitter

1) Ole Reigstad, Upper extremity and Microsurgical unit, Division of Orthopaedic Surgery, Oslo University Hospital, Norway*

The main content of abstract:

Objective
Scapholunate ligament injury or scaphoid non-union often lead to painful wrist arthrosis. Four corner fusion (4CF) is a treatment option if the radiolunate joint is spared. Prospective studies are scarce. 30 wrists in 28 patients (18 men) mean 53 (24-73) years were operated with four corner fusion (4CF) due to SLAC (22) or SNAC (8) wrist degeneration and prospectively followed. 7 wrists had 10 prior wrist surgeries. 10/28 had bilateral wrist affection (two had bilateral 4CF).

Methods
The patients were mean 53 (24-73) years. 4CF was achieved by bone transplantation (from the scaphoid/radius/iliac crest) and 1.1 mm K-wire fixation followed by 8 weeks cast immobilization. Preoperatively and at follow-up (1 year and every 2-3 years) we recorded AROM and pain (VAS) at rest and activity, QDASH, PRWHE, grip-strength and key-pinch. Radiographs of both wrists and CT of the operated wrist were taken preoperatively and at follow-up. Two peroperative complications occurred, one laceration of index finger extensor tendons (sutured, uncomplicated) and one ulnar nerve irritation due to a long k-wire (adjusted, no further problems).

Results
At follow-up 2 (1-7) years after surgery, 5 wrists had been converted to a total wrist arthroplasty (mean 1.4 (0.7-2.0) years after 4CF) due to pain and non-union (1) or pain and increased radiocarpal arthrosis The remaining wrists showed a significant reduction of pain at rest (33 to 15, p<0.001) and activity (67 to 25, p<0.001), QDASH (44 to 28, p<0.001) and PRWHE (57 to 25, p<0.001) as well as AROM (135° to 87°, p<0.001). We also found increased grip (26 vs 34 kgs, p<0.001) and key pinch strength (6.9 vs 8.5 kgs, p<0.001). Radiology including CT at follow-up confirmed healing in all except one (which was converted to arthroplasty).

Conclusions
Short term results after 4CF show satisfactory pain relief, function and strength at the expense of wrist motion. 17% of our cases were converted to total wrist arthroplasty (early failures). For the remaining patients the procedure postponed total wrist arthrodesis or total wrist arthroplasty.

Brief description of the abstract
30 wrist in 28 patients (53 years) had 4CF performed for SNAC/SLAC wrist degeneration using K-wires and cast immobilization. One non-union was seen, and altogether 5 patients were converted to total wrist arthroplasty during the mean 2 year follow-up. The remaining patients had significantly reduced pain, QDASH, PRWHE and AROM as well as increased function and grip-strength. 4CF can postpone total wrist arthroplasty or total wrist arthrodesis surgery.

O-16 Scapholunate motion during dart-throwing motion

Information about abstract submitter

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The main content of abstract:

Objective
Scaphoid and lunate motion has shown to be minimal during dart-throwing motion in studies based on serial computed tomography (CT) scans and in cadaver studies. This implicates that after repair of the scapholunate ligament, dart-throwing exercises could be safe. However, dynamic 4-dimensional CT analysis of wrists with a torn scapholunate ligament have shown that the scaphoid moves considerably more than the lunate towards the radius during the dart-throwing motion, inducing a scapholunate gap. The aim of our study was to analyze the direct motion between the scaphoid and the lunate during dart-throwing motion.

Methods
Standard wrist CT scans were obtained at maximum radial extension and ulnar flexion in 9 individuals with supposingly intact scapholunate ligaments. The images were analyzed using a volume registration tool that had been developed to detect early loosening (i.e revealing very small motions) of joint replacement implants by comparing sequential CT scans. Using this tool, the scaphoid was registered as fixed, thereafter, the lunate was registered and would shift position between the two scans only if there occurred a motion relative the scaphoid during the dart-throwing motion.

Results
There was no widening of the scapholunate distance between the end-positions of the dart-throwing motion. However, there was considerable motion between the scaphoid and the lunate. Both a distal to proximal translation and rotation between the bones took place during the dart-throwing motion.

Conclusions
Our findings suggest that dart-throwing exercises after scapholunate ligament repair are not safe unless the scaphoid and lunate are fixed with e.g pins or a screw.

Brief description of the abstract
The direct in vivo motion between the scaphoid and the lunate during dart-throwing motion was analyzed by comparing paired computed tomography wrist scans using a volume registration technique in 9 individuals. We found considerable direct motion between the scaphoid and the lunate during dart-throwing motion.

O–17 Experience with three consecutive cases of radiocarpal dislocations

Information about abstract submitter

1) David Tan, Department of Hand and Reconstructive Microsurgery, National University Hospital Singapore*
2) Pei Yein Tong, Department of Orthopaedic Surgery, Khoo Teck Puat Hospital, Singapore

The main content of abstract:

Objective
Pure radiocarpal dislocations are rare injuries of the wrist which represent a global destabilizing ligamentous disruption of the extrinsic stabilizers of the wrist. This retrospective review of three consecutive cases looks at the outcomes following primary ligament repair for early presenting cases and the salvage treatment for a delayed presentation.

Methods
3 consecutive cases of pure radiocarpal dislocations were managed by the senior author. There were 2 cases of Moneim type II dislocations and 1 case of a type 1 dislocation. 1 of the patient's with a Moneim type II dislocation presented as an occult injury with early ulnar translocation following surgical repair for assumed scapholunate dissociation. In the 2 cases treated at initial presentation, definitive repair of all palmar extrinsic ligaments, ulnar arcuate ligaments and dorsal radiocarpal ligament was performed. In the delayed presentation with ulnar translocation, a radioscapholunate fusion with distal scaphoidectomy was performed.

Results
Both patients treated early soon after presentation had a pain free and stable wrist with no evidence of ulnar translocation or arthritis. 1 of the patients suffered distal radioulnar joint instability after index surgical intervention and required a re-repair of the TFCC. The late presenting ulnar translocation achieved a pain free and stable wrist following limited fusion of the wrist and at final follow up all three patient achieved a good outcome based on the modified mayo wrist score

Conclusions
In patients presenting with pure radiocarpal dislocations, surgical repairs of all extrinsic radiocarpal ligaments prevent the sequel of late ulnar translocation, allow maintenance of a pain free and stable radiocarpal relationship whilst preserving range of motion. In late presentations, partial arthrodesis is a practical motion sparing procedure that eliminates pain and prevents further translocation.

O-18 Results Of Combined Treatment Of Extensor Carpi Ulnaris Instability And Triangular Fibrocartilage Complex Injuries In Patient

Information about abstract submitter

1) David Tan, Department of Hand and Reconstructive Microsurgery, National University Hospital Singapore*

The main content of abstract:

Objective
Hypothesis: TFCC repair alone is not enough to address DRUJ instability in patients with TFCC injury and ECU instability. Objective: To demonstrate that the simultaneous surgical treatment of TFCC tears and extensor carpi ulnaris tendon subluxation in patients with distal radioulanr joint instability reliably restores distal radioulnar joint stability and improves function.

Methods
Fifteen patients with DRUJ instability, peripheral TFCC tears, and ECU subluxation failed to regain satisfactory function after an average of six months of therapy. There were ten males and five females with an average age of 28 years old. They were managed with arthroscopy, open TFCC repair (n=11) or thermal shrinkage (n=4), and ECU subsheath reconstruction. We compared their preoperative pain, range of motion, grip strength and Mayo Modified Wrist Score (MMWS) to postoperative values at their most recent clinic review. Their follow up period ranged from 3.5 months to 4 years and 2 months (average 15 months) after surgery.

Results
All patients were either pain free (n=8) or had mild infrequent pain (n=7). Range of motion improved in 75% of the patients, the rest remained unchanged. Grip strength was improved in 7 of 9 patients. Preoperative MMWS could be computed in 9 patients. The average score was fair at 69 points. This improved to an average of 95 points postoperatively. The improvement in the MMWS was found to be statistically significant (p=0.0003). The average postoperative MMWS for all 15 patients in this study was 94 points. There were no complications observed and all patients had improvement in their pain rating and a stable DRUJ and ECU.

Conclusions
Simultaneous surgical management of both a TFCC tear and ECU instability in patients with DRUJ instability results in improved functional scores and pain scores and restores stability to the distal radioulnar joint and the extensor carpi ulnaris tendon.

O-19 Long-term (5—15 years) clinical outcome after titanium lunate arthroplasty for Kienböck´s disease

Information about abstract submitter

1) Martti Vastamäki, ORTON Research Institute, Finland*
2) Timo Viljakka, ORTON Research Institute, Finland
3) Kaj Tallroth, ORTON Research Institute, Finland

The main content of abstract:

Objective
Titanium lunate arthroplasty (TLA) for Kienböck´s disease was introduced in 1984 to address the silicone-wear particle problem common to silicone lunate implants. We sought to study the outcome of TLA.

Methods
We identified 11 patients with TLA. All subjects were male, age at surgery 47.3 (31-65) years and were followed for mean 11.0 (5.4-15.3) years. Seven patients had suffered traumatic low energic sprains. Time from the onset of symptoms to surgery ranged from 5 to 45 (median 19) months. Six patients had Stage IIIA and five stage IIIB disease. All patients had fracture or fragmentation of the lunate bone. We evaluated pain, ROM, function, and radiological outcome at a mean 11 years after surgery. We compared preoperative ROM and radiological findings to final follow-up in the ipsilateral wrist and made comparisons to the contralateral wrist.

Results
No implants were removed. VAS pain averaged at rest 0.5, at night 0.3, and during exertion 2.7. Preoperative ROM reached in extension 65% and in flexion 63% but grip strength was only 55%. After 11 years, extension and flexion of the affected wrists reached 71% of that of the contralateral wrists. These differences between affected and unaffected wrists were significant for all, $p < 0.05$. Grip strength was significantly better than before surgery, $p<0.05$, but still significantly inferior (81%) in the operated hand, $p<0.05$. DASH score averaged 9.6, optional DASH 9.7, and Mayo wrist score 67.7. Two patients had a dorsally dislocated implant.

Conclusions
Titanium lunate arthroplasty proved to be a valid solution for Grade III Kienböck´s disease. However, we are unsure whether this result is better than after the still rather obscure long-term natural course of Kienböck's disease or after other modern surgical techniques. More study is needed to improve the implant stability.

Brief description of the abstract
We identified 11 patients after TLA for Kienböck´s disease a mean 11.0 years after surgery. No implants were removed but two implants were dislocated, and no wrist joints were fused. VAS pain averaged at rest 0.5, at night 0.3, and during heavy exertion 2.7. ROM reached 70% of that of the contralateral wrist, and strength 81%. DASH score averaged 9.6, optional DASH 9.7, and Mayo wrist score 67.7. Titanium lunate arthroplasty seems to be one useful treatment for Grade III Kienböck´s disease.

Track: Other

O-20 Constrained distal radioulnar implant arthroplasty: 27 cases; mean follow-up 3,5 years

Information about abstract submitter

1) Peter Axelsson, Dept. Hand Surgery, Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Sweden*

The main content of abstract:

Objective
To report clinical and radiographic outcomes for the Scheker Total DRUJ prosthesis.

Methods
We reviewed all Scheker arthroplasties performed at our department. 27 cases had a minimum follow-up of one year. Five patients were lost to follow-up; two due to significant unrelated illness, one deceased and two implants were revised. The 22 remaining implants had a mean follow-up of 3,5 years. Assessment included; DASH and PRWE questionnaires, Visual Analogue Scales for pain and satisfaction, measurements of range of motion and strength for grip. For 9 patients, also preoperative Lifting- and forearm rotational strength was recorded. The change in preoperative and last follow-up recordings was analyzed with Wilcoxon sign rank test.

Results
Data for all outcome measures at final follow-up visits are summarized in table 1. There was a significant improvement in all parameters except for Lifting-strength in supinated and pronated position were there was a lack of preoperative data. We did not detect radiographic signs of implant loosening except for two patients of which one had a modified shorter ulnar stem. One of these implants was removed and the other one revised. Another patient had the implant removed due to infection and one patient underwent successful revision of a too small ulnar stem. There were in all seven reoperations, two due to periprostetic radius fractures.

Conclusions
In a selected group of patients with severe DRUJ conditions, the Scheker implant produced favorable outcome but the complication rate was noteworthy.

Brief description of the abstract
We reviewed 27 consecutive Scheker arthroplasties performed at our department. Five patients were lost to follow-up, three due to unrelated illness and two due to revision of the implants. For the remaining 22 procedures, we found that outcome measures as; DASH and PRWE, Visual Analogue Scales, range of motion and strength for Grip and forearm rotation improved significantly. There were seven reoperations including two revisions and two surgeries for periprosthetic fractures. .

O-21 Integration of the Multi-Disciplinary Hand Meeting in an NHS Plastic Surgery Department

Information about abstract submitter

1) Andrew Hart-Pinto, Bedford Hospital, United Kingdom*
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3) Kavish Maheshwari, Bedford Hospital, United Kingdom
4) Sandip Hindocha, Bedford Hospital, United Kingdom
5) Rakhee Nayar, Whiston Hospital, United Kingdom

The main content of abstract:

Objective
Amongst patients with complex disorders of the hand, multi-disciplinary teams (MDT) represent a new standard of care. Many patients present with highly complex injuries or conditions. In these cases, individuals can be challenging to manage without highly specialised team management. MDT meetings

permit the constructive evaluation of complex patients presenting to our services, further facilitating the formulation of an individualised management protocol, and improving patient outcomes.

Methods
Authors successfully introduced and developed a specialist hand multidisciplinary team meeting. This process involved gaining support and recruitment of specialist colleagues. In addition, the identification of an appropriate location and timing of meeting permitted maximum representation from all specialities. A dedicated MDT co-ordinator was recruited to organise meetings, and distribute outcomes.

Results
The Multi-Disciplinary Team Meeting, introduced in 2019 in Bedford Hospital NHS Trust plastic surgery department includes; Plastic Surgery consultants, middle grade surgeons, senior hand therapists, Mustlo-skeletal specialist radiologist, and specialist nursing staff. Meetings are held monthly, to permit regular discussion of complex and challenging hand patients. Clinicians can book patients for discussion via an MDT co-ordinator. Decisions made during the MDT, published in a summary report for all clinicians, are subsequently integrated into patients care plan.

Conclusions
The introduction of the MDT hand meeting has improved decision making and patient outcomes for patients with complex needs. The process has created a forum for inter-speciality discussion and management plan formulation. Certainly, an improvement in the care of patients has been observed. Authors recommend the development of a MDT meeting for all specialist hand units.

Brief description of the abstract
Authors present the development of a specialist hand multidisciplinary team (MDT) meeting at Bedford Hospital NHS Trust. The MDT development has facilitated improved decision making amongst highly complex plastic surgery hand patients as well as trainees teaching and research. Furthermore, the process has augmented inter-speciality relationships, with the aim of improving patient outcomes. Authors recommend the development of a MDT meeting for all specialist hand units.

O-22 Risk factors of hospitalization for carpal tunnel syndrome among the general working population

Information about abstract submitter

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The main content of abstract:

Objective
Carpal tunnel syndrome (CTS) causes a considerable amount of sick leaves and healthcare costs. The etiology of CTS is considered multifactorial, with both personal and occupational risk factors. To date, few prospective cohort studies on the occupational risk factors of CTS have examined the general

working population. The aim of this study was to assess occupational risk factor for CTS in general population.

Methods
The study population consisted of the Northern Finland Birth Cohort 1966 participants who attended the cohort's 31-year follow-up in 1997 and were active in working life (N=6326). Information on socio-economic status, weight and height, smoking, exposure to occupational physical factors (heat, cold, temperature changes, vibration to hands), and long-term illnesses (diabetes, thyroid diseases, rheumatoid arthritis) was collected at baseline in 1997. Data on hospitalizations due to CTS was obtained from the Care Register for Health Care, 1997—2016.

Results
In 1997-2016, 3.4% of the participants were hospitalised for CTS. Adjusted for confounders, women (hazard ratio [HR]=3.77, 95% CI 2.70-5.25), overweight/obese participants (HR=1.69, 95% CI 1.29-2.22), smokers (HR=1.48, 95% CI 1.12-1.96), farmers and manual workers (HR=3.02, 95% CI 1.85-4.92 compared with upper clerical workers), lower clerical workers (HR=1.74, 95% CI=1.08-2.80), workers exposed to hand vibration (HR=2.29, 95% CI=1.48-3.54) and workers with physically demanding jobs (HR=1.71 CI=1.06-2.76) were at increased risk of CTS; latter increased the risk of CTS for overweight/obese participants, but not for normal weight participants.

Conclusions
Excess body mass and occupational physical factors increase the risk of hospitalization for CTS. Excess body mass potentiates the adverse effects of strenuous work on CTS. Female gender, overweight/obesity and smoking are associated with increased risk of hospitalization for CTS.

Brief description of the abstract
To date, few prospective cohort studies on occupational risk factors for CTS have examined the general working population. Our prospective cohort study of a large birth cohort (N=6326) aged 31 at baseline found that excess body mass and occupational physical factors increase the risk of hospitalization for CTS. Excess body mass potentiates the adverse effects of strenuous work on CTS.

O-23 Novel technique in Cubital Tunnel release and fascial epicondylar augmentation in cases with ulnar nerve instability

Information about abstract submitter

1) Martins Kapickis, Centre of Microsurgery, Latvia*
2) Marta Rudakovska, Centre of Microsurgery, Latvia

The main content of abstract:

Objective
Cubital tunnel syndrome is one of the most common compression-traction neuropathy in the upper extremity. There is a subclass of patients in whom there is ulnar nerve laxity with subluxation of the nerve over the medial epicondyle where no conservative treatment is satisfactory. Currently most popular surgical reconstruction for subluxation is anterior transposition of the nerve, which is well accepted method, but in these cases, we do not consider transposition, but orthotopic securing of the nerve using epicondylar augmentation technique and limited resection of the underlying medial head of triceps.

Methods
In this pilot study we included 6 patients with positive EMNG and symptoms of cubital tunnel syndrome and laxity-subluxation of the ulnar nerve documented in the ultrasound investigation

Results
5 patients had symptom and grip strength improvement. First patients in our pilot study group were performed in 2017, therefore repeated EMNG were done only in the first three patients with reduction of axonal damage and improvement of NCV. Repeated ultrasound study did not reveal any signs of subluxation. One patient continued to have symptoms and did not improve, so submuscular transposition was performed with satisfactory result

Conclusions
Pilot study is rather small to draw any statistically relevant conclusions. Nevertheless, results are encouraging. With this technique nerve segmental vascularity is preserved, innervation to the FCU muscle is not jeopardised and Ulnar nerve glide-floss exercises are possible as opposed to standard subcutaneous transposition technique. No slings are used for nerve stabilisation which we consider contradiction to the surgery of nerve release.

Brief description of the abstract
In this pilot study we propose that in subpopulation of patients with cubital tunnel symptoms and laxity of the ulnar nerve, orthotopic securing of the ulnar nerve with fascial augmentation of medial epicondyle provides opportunity of adequate nerve stretch and glide exercises, thus minimizing scarring opportunity and preserving vascularity of the nerve and decreasing possibility of the FCU motor branch injury.

O-24 Compensation after hand surgery. A review of 1321 claims to the Norwegian System of Patient Injury Compensation 2007-2017

Information about abstract submitter

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2) Sunniva Martine Kolstad Addison, University of Tromsø - Arctic University of Norway
3) Sølvi Flåte, The Norwegian System of Patient Injury Compensation, Norway
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The main content of abstract:

Objective
Hand surgery makes up a large volume of operations, ranging from simple to complex procedures. Increasing degree of complexity increases the demands on hand surgery competence and can result in patient injuries depending on several conditions. The purpose of the present study was to assess the compensation claims filed to The Norwegian System of Patient Injury Compensation (NPE) after hand surgery.

Methods
From the NPE database, cases from the period 01.01.2007 to 30.06.2017 for hand surgery were defined based on specific codes. Patient demographics were recorded, along with variables such as diagnosis, type of injury, injury location, the reason for the claim, compensation, and whether the claims were accepted or rejected.

Results
In the period, 1321 claims relating to hand surgery were received. This is 1/10 of the claims compared with orthopaedic surgery. There were 532 granted claims (40.3%), which was significantly higher for trauma- (45.5%) compared to elective (34.2%) cases. Hand fractures and mononeuropathies were the most common diagnoses. Local hospitals had the highest number of cases (61.9%). Granted claims

differed not significantly for levels of care. The most common reason for granted claim was "failure of treatment". Twenty percent of the granted claims had a disability percentage > 15%. Elective surgery accounted for ⅔ of the granted disability cases.

Conclusions
Hand surgery has as many granted claims as orthopaedic surgery in general. The proportion granted claims is higher than that seen for the ten largest medical fields in Norway. There was a larger proportion of granted claims for trauma cases than for the elective cases, but the elective cases had more of the granted claims with disability over 15%. For trauma cases the most common diagnosis was hand fractures, whilst mononeuropathy in upper limb was the most common diagnosis for elective surgery. Both of these diagnoses may be considered as less complex surgery and may indicate a need of special focus.

Brief description of the abstract
Of 1321 claims after hand surgery filed to the Norwegian System of Patient Injury Compensation from 2007-2017, 40.3% of the claims were granted. This was 7.3% higher than the average for the ten largest medical fields in Norway. There were more claims granted for trauma cases than for elective cases. Hand fractures and mononeuropathies were most common. There was no significant difference between levels of care. Twenty percent of granted claims had a disability percentage of 15% or more.

O-25 Finland's first Targeted Muscle Reinnervation (TMR) patient

Information about abstract submitter

1) Georgios Pierides, Helsinki University Hospital, Finland*

The main content of abstract:

Objective
In the Nordic Countries 0.1-150/100 000 inhabitants/year undergo an amputation through the wrist joint or proximally. Ca. 40% of them suffer from either chronic residual limb pain or phantom pain or both. Myoelectric prostheses (MEP) offer functional aid for the committed patient. TMR is a surgical technique in which nerves commanding e.g. finger and wrist movements are rerouted into muscles of the upper arm. Hence, a MEP can detect more muscle action potentials and the patient can trigger them mimicking native physiology. This enables a more varied and intuitive MEP control. TMR has also been demonstrated to decrease post-amputation pain.

Methods
A 50-year-old man with no comorbidities suffered a traumatic elbow disarticulation to his dominant arm in a work-related accident in August 2018. Gross contamination and severe crush injury prevented replantation. Instead, a debridement and shortening of the humerus were carried out with the wound left open. After two days of observation, negative pressure wound therapy commenced. At ten days, wound closure and TMR surgery were performed. The ulnar nerve was coapted to innervate the brachial muscle, the median nerve was transferred to the short head of the biceps muscle, and the radial nerve to the lateral head of the triceps muscle.

Results
The patient was discharged on the first postoperative day. Wound healing was uneventful. Moderate residual limb pain and phantom limb pain requiring pain medication were reported by the patient during the first three months after which they became mild and intermittent. Currently, the patient takes no pain medication. Voluntary action potentials have been found from all reinnervated and native muscles. Rehabilitation is underway with visualisation and coordination practice of the muscle signals on the

monitor and on the detached prosthesis. Manufacturing of the prosthesis sleeve will take place in the following months.

Conclusions
Reinnervation of the intended upper arm muscles occurred and are picked up by MEP electrodes. The patient's pain decreased after 3 months of TMR to levels requiring no pain medication. TMR may offer a select group of major upper extremity amputees a more useful control of the MEP and decrease or prevent chronic pain.

Brief description of the abstract
Targeted muscle reinnervation (TMR) is a surgical means to diversify and facilitate signal triggering for the control of a myoelectric prosthesis (MEP). It also decreases chronic pain. An upper arm amputee was subjected to Finland's first TMR. Reinnervation took place in every intended muscle. Pain medication is no longer required. Signal separation and control of a MEP is succeeding. TMR may provide an easier and a more diverse way of controlling a MEP and reduce the chances of chronic pain.

O-26 Hand Surgery using regional block anesthesia – The Patient's perspective

Information about abstract submitter

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The main content of abstract:

Objective
The use of regional block anesthesia has advantages for both patients as well as surgeons including safety, effectiveness and less morbidity. The purpose of this study was to analyze and gain evidence on how patients feel about hand surgery performed under regional block anesthesia (RBA). This included looking into the anxiety pattern and need for analgesia after surgery.

Methods
This is a prospective review of 52 consecutive patients who underwent hand surgery for various indications under RBA. A modified questionnaire adapted from the Patient Outcome Questionnaire by the American Pain society (APS-POQ) was used to assess patient satisfaction at 2 weeks post surgery. This questionnaire included the patients own assessments of their anxiety in the preoperative, intra-operative and postoperative period along with the pain measures using the Visual Analogue score. The hospital stay in hours and the type of analgesia required post-operatively was also assessed.

Results
Majority of patients reported very low intra and post operative anxiety scores. <10% patients experienced postop nausea. All patients were discharged the day of surgery with an average stay of only 9.1 hours. 81% patients reported they were at least 'Reasonably Comfortable' at the time of discharge. Patients had good pain relief for an average 11.5 hours after discharge with most finding relief with oral analgesics thereafter. 86.5% stated they would prefer to be wide awake with RBA if they were to have another surgery. Almost 95% patients rated their overall experience to be either 'Very good' or 'Excellent' .

Conclusions
RBA has the obvious advantage to the surgical team in terms of a efficient high turnover list but as seen in this study it also improves the patients peri-operative experience. Patients had a high satisfaction rate

in terms of pain management during and after the surgery. Patient awareness and involvement with the surgical process was a major factor leading to a positive patient experience and almost all patients would recommend surgery under RBA to their friends and family.

Brief description of the abstract
The purpose of this study was to analyze and gain evidence on how patients feel about hand surgery performed under regional block anesthesia (RBA). 52 consecutive patients who underwent hand surgery for various indications under RBA were reviewed using a modified questionnaire adapted from APS-POQ at 2 weeks postop. Patients reported very low perioperative anxiety with all patients being discharged on the day of surgery. Patients also reported excellent pain relief & very high satisfaction rate.

O-27 A Helping Hand: Continuous Quality Improvement and Hand Trauma

Information about abstract submitter

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The main content of abstract:

Objective
Whiston Hospital is a tertiary centre for Burns and Plastic surgery in the North West of England. It has been audited every year for hand trauma, focusing on treatment timings based on the 2005 (updated in 2017) British Society for Surgery of the Hand (BSSH) guidelines, which is the most current UK document on this subject. A dedicated trauma assessment unit was introduced in 2015; only 74% of audited patients complied with the BSSH referral to treatment (RTT) target of 90%. Quality improvements were introduced: • A weekday dedicated trauma assessment unit • The 'Whiston Hospital Hand Proforma' • 7 day operating lists • Audit and review

Methods
A two month (May-Jun 2018) audit of prospective data was collected from the unit logbook and hand proforma, accessed via the hospital e-data management system. Quality standards were: BSSH RTT guidelines for "vascular compromise/ acute infection" treated on day of admission (D0); "open fractures/ contaminated/ bite wounds" within 24h (D1); "tendon/ nerve damage" by five days (D5) and "soft tissue" by seven days (D7).

Results
Data was collected for 381 patients of whom 278 cases for hand trauma were analysed. The mean age was 43y (range 15 — 89y) and 74.6% were male. 256 patients were treated within BSHH guideline times, giving the trauma unit a 92% RTT compliance rate, compared to 84% in 2016 and 89% in 2017. With regard to specific treatment time targets, 91.7% of patients were treated at the D0 target; 80% at D1; 89.7% at D5 and 99% by D7. Patient referrals increased from a mean of 75/month in 2015 to 170/month in 2018.

Conclusions
2018 was the first year that the unit has achieved >90% of hand injuries to be treated within BSSH RTT guidelines. Factors contributing to the success of this, which could be applied to other units include: trauma theatre lists occurring seven days a week; improved 24h access to an emergency theatre; the use of a "Hand Proforma" to allow the effective gathering of salient information and appropriate triage,

so clinical staff can maintain awareness of treatment goals; and re-audit to uphold accountability and identify areas of improvement.

Brief description of the abstract
The plastics trauma unit at Whiston Hospital, UK aimed to comply with British Society for Surgery of the Hand (BSSH) guidelines for referral to treatment targets (RTT) for hand trauma. Quality improvement was introduced, with a proforma for documentation and triage using BSSH guidelines, a dedicated weekday assessment unit and 24/7 theatre access for hand trauma cases. Compliance to RTT guidelines improved from 74% in 2015 to 92% in 2018: a positive outcome for both staff and patients.

O-28 Interposition of Perforator Flaps for Burn Scar Release in Upper Extremity

Information about abstract submitter

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The main content of abstract:

Objective
The presence of contracted burn scar in upper extremity always disables function of arm and can lead to ulceration due to scar instability. Z-plasty or scar excision could be good options for narrow scars, skin grafting often can be unsuccessful due to graft necrosis or secondary contracture. Axial pedicled or free flaps could be used for more complex defects and often are more time consuming. Propeller perforator flaps could be one of options for scar release.

Methods
Postburn scar patients with contracture scars in upper extremity were included. Flap design was planned over major axial blood vessels, one of flap edge was on the scar border. Doppler was not used and scar release was planned at the projection point of intraoperatively found perforator vessel. Primary closure of donor site was important point. Flap length should reach undamaged skin on other side of scar to provide full contracture release.

Results
Sixteen perforator flaps on thirteen patients were performed. All donor sites were closed primarily. 3 flaps had distal tip necrosis which healed secondarily. One flap had severe hematoma with surgical evacuation and uneventful healing. Follow up time was twelve months. All patients had improved subjective feeling of scar tightness. The width of flap enlarged 110 percent (85 to 130). All patients were satisfied with donor site scar lying on burn scar border.

Conclusions
Perforator flaps planned on burn scar contracture border can be very reliable option on release of broad scar. This option should be first choice due to same skin colour and flap thickness as in recipient site. Elastic skin can provide some percent of flap width expansion in future so preventing progress of contracture. Since available perforator can be found in any region of upper extremity, only limiting factor for use of perforator flap can be large size of scar.

Brief description of the abstract
Surgical treatment of burn scar contracture in upper extremity can include various options . We reviewed our experience with use of perforator based flaps with special attention using them along burn scar. This technique can leave inconspicuous donor scar with good skin and subcutaneous tissue match. Sixteen perforator flaps on thirteen patients were performed. Tip necrosis occured in 3 cases. One case required reoperation due to hematoma. All patients improved their function and appearance.

O-29 Validity and internal consistency of the Thoracic Outlet Syndrome Index (TOSI) for patients with thoracic outlet syndrome.

Information about abstract submitter

1) Martti Vastamäki, ORTON Research Institute, Finland*

The main content of abstract:

Objective
No validated scales exist specifically for measuring quality of life (QoL) and functioning level in patients with thoracic outlet syndrome (TOS). This cross-sectional survey examined whether some items adopted from validated quality of life scales could be suitable for patients with TOS.

Methods
To find an optimal Thoracic Outlet Syndrome Index (TOSI), a panel of 14 specialists experienced in treating TOS evaluated independently the relevance of 19 items adopted from scales used in other upper extremity syndromes. After their undergoing surgery for TOS, 52 patients rated the relevance of those items found by experts to be relevant. Content validity was measured by a content validity index, a content validity ratio, and a modified kappa. The internal consistency of 15 retained items was assessed with Cronbach`s α and its construct validity by an exploratory factor analysis.

Results
Of the 19 items, 15 were considered relevant for TOS by the panelists with an overall test CVI (S-CVI) of 0.93. The internal consistency of these 15 items was excellent. The exploratory factor analysis accompanied by a parallel analysis confirmed the uni-dimensionality of TOSI. All our 15 items that the panelists considered relevant were also ones that the patients marked with scores over 7 on an 11-point scale of relevancy.

Conclusions
The internally consistent, face and content valid TOSI scale is proposed for use in evaluating specifically the QoL in TOS as well as to improve future longitudinal studies comparing functioning before and after interventions or spontaneous recovery of TOS.

Brief description of the abstract
14 specialists experienced in treating TOS and 52 TOS patients evaluated the relevance of 19 items adopted from scales used in other upper extremity syndromes. This research suggests a new validated 15-item self-reported test, TOSI, to measure the QoL and functional level of patients with TOS. The new TOSI scale is internally consistent as well as face- and content valid for TOS patients. It may improve studies comparing functioning before and after interventions or spontaneous recovery of TOS.

O-30 Perichondrium transplantation compared with SR implants for restoration of MCP and PIP joints, long-term outcome.

Information about abstract submitter

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The main content of abstract:

Objective
Two-component surface replacement (SR) implants is currently the most common method to reconstruct osteoarthritic finger joints in the non-rheumatoid patient. Short term results can be gratifying, but in the long-term SR implants struggle with limited survival rate due to loosening, implant subsidence and stiffness. Transplantation of rib perichondrium is an alternative method to reconstruct osteoarthritic finger joints. The aim of this study was to compare the long-term outcome after perichondrium transplantations and SR implants to the metacarpo-phalangeal (MCP) and the proximal interphalangeal (PIP) joints.

Methods
Comparative retrospective cohort study of patients operated at Uppsala University hospital between 1981-2018. 102 patients with SR implants (138 joints) and 22 patients with perichondrium transplantations (25 joints) were included in the study. These groups were subdivided into MCP (n=31) and PIP (n=132) joints. All medical charts were searched for any secondary surgery, including revision, implant extraction, or fusion of the joint. Follow-up ended on the day of revision, death, or February 28th 2018, whichever came first. Cumulative unadjusted component survival was calculated using the Kaplan—Meier method.

Results
MCP group: The revision rate was 25% (4 out of 16 joints) in the SR group and 13% (2 out of 15 joints) in the perichondrium group. PIP group: The revision rate was 24 % (29 out of 122 joints) in the SR group and 20 % (2 out of 10 joints) in the perichondrium group. The survival rate was higher in the perichondrium group in the MCP joint (86.7 % CI 69.4 - 100.0 vs. 75 % CI 53.8 - 96.1 p-value 0.387) and the PIP joint (80 % CI 55 — 100.0 vs. 74.7% CI 66.6 — 82.7 p-value 0.685). The median age at index surgery was 45 years (18-61) for transplants, and 64 years (24-82) for implants. The median follow-up time was 7 years (0-35).

Conclusions
The long-term outcome after perichondrium transplantation at least equals the results obtained with modern SR implants. The patients operated with perichondrium transplantation were considerably younger than the patients operated with implants. At the MCP level the patients with transplants were on average 16 years younger than the implant patients. At the PIP level the transplant patients were on average 13 years younger. Resurfacing of finger joints using perichondrium is a method worth considering, especially in young patients. The method has low revision rate and preserves most of the anatomy, which makes later implant surgery possible.

Brief description of the abstract
Long-term outcome after perichondrium transplantation and surface replacement implants to the metacarpo-phalangeal (MCP) and the proximal interphalangeal (PIP) joints. The survival rate was higher in the perichondrium group in the MCP joint (86.7 % vs. 75 %) and the PIP joint (80 % vs. 74.7%). Resurfacing of finger joints with perichondrium is a method worth considering, especially in young patients. It has low revision rate, preserves most of the anatomy, making later implant surgery possible.

O-31 A study of the effect of angle of arthrodesis of PIPJ on the grip strength.

Information about abstract submitter

1) Jieying Xu, Tan Tock Seng Hospital, Singapore*

The main content of abstract:

Objective
Arthrodesis of the Proximal Interphalangeal Joint (PIPJ) is a procedure that is done for a variety of indications. Although there are many studies describing technique for stable arthrodesis, there are none showing objective markers for optimal angle of fusion of PIPJ, that has been arbitrarily set at 40 degrees of fusion. A more gentle angle of fusion is more desirable in terms of cosmesis, although it raises concern about the grip strength and functionality. Our study aims to study the effect of angle of fusion of the PIPJ on the grip strength through the quadriga effect.

Methods
Fifty volunteers with no pre-existing painful hand conditions are recruited for this study. Circumferential splints are fabricated for the middle and ring finger, immobilising the PIPJ at 0, 20 and 40 degrees. Grip strength is measured using the JAMAR dynamometer when the subjects are not wearing splints, and when they are wearing each of the splints. The grip strength when wearing the different splints are expressed as a ratio of the grip strength without "fusion" of the PIPJ. The Wilcoxon signed rank test is used to test for the significance of the data.

Results
There is lesser decrease in grip strength when the middle and the ring fingers is fused at 40 degrees, compared to 0 and 20 degrees of fusion. However, if a difference in the grip strength by 10% is taken to be significant, there is no statistical significance decrease in the grip strength when the PIPJ of the middle and ring finger are fused at 20 degrees, as compared to 40 degrees. The fusion of the middle finger causes a greater drop in the grip strength as compared to fusion of the ring finger. The decrease in the grip strength with fusion of the PIPJ, as compared to without fusion, is also less significant in bigger grip span.

Conclusions
Fusion of the PIPJ at 20 degrees confers better functionality and cosmetic appearance, with no significant decrease in the grip strength, and should be adopted as the preferred angle of fusion.

Poster abstracts

Track: Distal radius fracture and associted injuries

P-01 Three-dimensional Digital Analysis of Anatomy and Radiographic Parameters of the Distal Radius

Information about abstract submitter

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3) Nina Lindfors, Töölö hospital, Helsinki University Hospital, Finland

The main content of abstract:

Objective
The management of distal radial fractures is guided by the interpretation of radiographic findings.The most commonly used anatomic radiographic parameters of the distal articular surface of the radius include the volar tilt and the radial inclination. However, the reliability of these measurements is low. The aim of this study was to use a novel digital three-dimensional imaging processing method designed for cone-beam computed tomography (CBCT) to evaluate the longitudinal axis of the distal radius, the

volar tilt and radial inclination angle measurements, and the anatomy of the scaphoid and the lunate facets.

Methods
CBCT scans of 50 intact distal radii were included in the study. An image analysis software was developed for the research project, and a mathematical model of the radius was created using the CBCT scan. Using the 3D model, the longitudinal axis of the radius was determined, and based on intra-articular landmarks of the radius, measurements of the volar tilt and radial inclination angles were defined. In addition to measuring the volar tilt angle in sagittal plane, the angle was determined via an oblique line between the most distal tips of the volar and the dorsal rim. The areas of the scaphoid facet and the lunate facet were determined.

Results
The direction of the longitudinal axis of the distal radius was affected by the location of its measurement. The optimal measuring location of the axis was between 53.3 and 28.8 mm from central reference point (CRP). The mean volar tilt angle was 9.1° along the lunate facet and 11.2° along the concave part of scaphoid facet. The mean volar tilt angle via the volar and dorsal rim tips, mimicking the volar tilt measurement on standard radiographs, was 13.0°. The mean radial inclination angle was 21.8° using CRP as the reference point. On average, 48.6% of the articular surface was covered by the lunate facet and 51.4% by the scaphoid facet.

Conclusions
The direction of the distal radius' longitudinal axis depends on the location of the longitudinal segment used in its measurement, and hence, the location of this longitudinal measuring segment also affects the volar tilt and radial inclination angles. The volar tilt angle varies along the articular surface of the distal radius, as was determined with our new digital 3D imaging processing method. This study shows that the distal rim tips used to determine volar tilt angle in two-dimensional imaging are located volarly on the lunate facet and dorsally on the concave scaphoid facet.

Brief description of the abstract
The aim of this study was to use a novel digital 3D imaging processing method designed for cone-beam computed tomography (CBCT) to evaluate the longitudinal axis of the distal radius, the volar tilt and radial inclination angle measurements and the anatomy of the scaphoid and the lunate facets. The direction of the distal radius' longitudinal axis depends on the location of its measurement segment. The study shows the volar tilt angle variation along the articular surface of the distal radius.

Track: Elbow and forearm

P-02 Arthroscopic release of the pronator-flexor origin for recalcitrant medial epicondylitis

Information about abstract submitter

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2) Takuro Wada, Department of Orthopedic Surgery, Hokkaido Saiseikai Otaru Hospital, Japan

The main content of abstract:

Objective
It has been reported that arthroscopic débridement and/or release of the extensor carpi radialis brevis origin are effective for recalcitrant lateral epicondylitis. It was demonstrated by using cadaveric models that an arthroscopic procedure for medial epicondylitis is also feasible and can be safely completed. However, the clinical outcomes of arthroscopic procedure for medial epicondylitis remained unclear. We

performed arthroscopic surgery for medial epicondylitis and evaluated pain relief, self-assessed functional outcome and complications after the procedure.

Methods
Arthroscopic partial release and débridement of the common pronator-flexor origin were performed in six elbows of five patients (male, 3; female, 2; mean age, 50.8 years) with recalcitrant medial epicondylitis. Range of motion and valgus instability of the elbow, spontaneous pain, motion pain and data in the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire were assessed preoperatively and at the final observation (mean follow-up, 15.3 months). Return to activity and pain were evaluated according to Nirschl and Pettrone's grading system. Surgical complications were investigated from medical records and interviews with patients.

Results
The range of flexion recovered to the same as that on the contralateral side by the final follow-up in all cases. Postoperative valgus instability was not observed. The average scores for pain at rest and during activity improved from 5.4±4.1 to 0.7±1.2 and from 8.4±1.8 to 1.8±1.8, respectively. The mean DASH score improved from 58.1±21.9 to 7.5±9.2. Improvement of the DASH score was more than 15 points in all elbows. According to Nirschl and Pettrone's grading system, the outcomes were excellent for 3 elbows and good for 3 elbows. Medial antebrachial cutaneous nerve irritation occurred in one elbow, but finally resolved.

Conclusions
Arthroscopic partial release and débridement of the common pronator-flexor origin is effective and safe procedure for recalcitrant medial epicondylitis.

Brief description of the abstract
We performed arthroscopic partial release and débridement of the pronator-flexor origin for recalcitrant medial epicondylitis in six elbows of five patients (mean age, 50.8 years; mean follow-up, 15.3 months). The average VAS score for spontaneous and motion pain as well as the mean DASH score improved. The outcomes were excellent or good in all elbows according to Nirschl and Pettrone's grading system. Medial antebrachial cutaneous nerve irritation occurred in one elbow, but finally resolved.

Track: Hand and finger fractures

P-03 Factors affecting the time taken for healing of metacarpal fractures

Information about abstract submitter

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The main content of abstract:

Objective
Metacarpal fractures are common within the general population. There is a wide range of presentation with respect to age, patient background, mechanism of injury, fracture characteristics and treatment methods. In this study we aim to evaluate possible factors that may lead to increased healing time of metacarpal fractures. A retrospective review of patients treated for metacarpal fractures at a single hand surgery department from 2016 to 2017 were evaluated. Patients who were lost to follow-up, had incomplete records or delayed clinic appointments were excluded.

Methods
The number of days taken for fracture union was recorded. This was determined by the presence of bridging callus noted on radiographs in at least 2 views. For patients who were treated surgically, the number of days taken for fracture healing was calculated from the time of surgery. Patient demographics and background, nature of the injury, fracture characteristics and treatment methods were analyzed to determine any associations with the time taken for fracture union.

Results
345 patients were included. Average age at injury was 35.6 years (SD = 28.0). The average healing time was 43.7 days (SD = 23.3). Presence of an open fracture, high-energy injury, articular involvement and associated neurovascular injury were associated with longer time to union. None of the patient related factors such as age, ethnicity, gender, medications, and past medical history were found to be associated with longer healing time. No significant difference found between patients who were treated surgically and non-surgically.

Conclusions
Knowledge of the factors associated with longer healing time in metacarpal fractures may influence treatment decisions in our practice.

Brief description of the abstract
In this study we aim to evaluate possible factors that may lead to increased healing time of metacarpal fractures. A retrospective review of 345 patients was conducted. Presence of an open fracture, high-energy injury, articular involvement and associated neurovascular injury were associated with longer time to union. Knowledge of the factors associated with longer healing time in metacarpal fractures may influence treatment decisions in our practice.

P-04 Morphology of finger middle phalanx base

Information about abstract submitter

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2) Diyaa Algazwi, Department of Diagnostic imaging, National University Hospital, Singapore
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5) Andre Eu Jin Cheah, Department of Hand and Reconstructive Microsurgery, National University Hospital, Singapore

The main content of abstract:

Objective
Surgical management of middle phalanx base fracture is challenging. Anatomical reduction and restoration of the middle phalanx base volar lip angle is crucial to regain full range of motion and function of proximal interphalangeal joint. A good understanding of the normal volar lip angle is important for operative planning. However, there is inadequate information in the literature about the normal range of middle phalanx base volar lip angle. The aim of our study is to determine the normative value for middle phalanx base volar lip angle.

Methods
We reviewed normal finger X-rays done in skeletal matured patients between 1st Jan 2017 to 31st October 2017. Only normal finger X-rays were included in our study, all the finger X-rays with new or old pathology were excluded. Measurements were done on General Electric (GE) Picture Archiving and Communication System (PACS). We measured the volar lip angle of middle phalanx base on the true

lateral view; and width of middle phalanx base on the anterior -posterior view. All data were entered onto Excel spreadsheet and statistical analysis was performed using SPSS software.

Results
We reviewed 200 finger X-rays, 50 for each finger, excluding thumb. The mean middle phalanx volar lip angle for index, middle, ring and little fingers are 49.75, 50.22, 50.59 and 49.50 degree respectively. The mean middle phalanx base width for index, middle, ring and little fingers are 0.96, 1.01, 1.14, and 0.81cm respectively. Statistical analysis showed that there is no significant difference of volar lip angle among different fingers ($p=0.355$). However, we found significant correlation between volar lip angle and middle phalanx base width ($p < 0.05$).

Conclusions
The mean middle phalanx base volar lip angle for all fingers is 50 degree. There is no significant difference of volar lip angle between different fingers. This result is useful as guidance for surgical fixation of middle phalanx base fracture, as well as future anatomical implant design for middle phalanx base injury.

Track: Tendons

P-05 Spontaneous triceps avulsion: A rare injury, often missed

Information about abstract submitter

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The main content of abstract:

Objective
We present a case of spontaneous rupture-avulsion of triceps tendon and present a management protocol along with a review of literature

Methods
Case report of a 48 year old gentleman, who was a gym enthusiast, who presented to us 10 days after the initial trauma while lifting a heavy weight in the gym, when he experienced a sharp pain in his left elbow and it was followed by swelling. He was unable to extend his elbow and came to our clinic in this regard. An X-ray showed an avulsed bone chip from the olecranon process and a diagnosis of a spontaneous triceps rupture-avulsion was made. He gave a history of anabolic steroid intake and also had a history of factor XII deficiency with a variant of von Willebrand's disease, with easy bruisability and occasional spontaneous bleeds

Results
He was taken to the theatre and the repair was done under general anaesthesia where inter-osseous wiring was done using Ethibond sutures. He developed a superficial surgical site infection in the post-operative period but was managed with drainage and antibiotics. Thereafter his recovery was good and one year after that repair, the patient is back to weight lifting and is doing well.

Conclusions
Although rare injuries, they do however come into the clinic once in a while. They're often missed early and thus there is a need to establish a management algorithm and a high index of suspicion. A second look is thus warranted in these elbow injuries once the local swelling subsides, where a palpable depression proximal to the olecranon, loss of elbow extension, and X-ray findings of a flake sign or an

avulsed bony chip, clinches the diagnosis. They respond well to surgical repair, and amongst various methods available. The recovery is generally good and most return to normal physical activities.

Brief description of the abstract
Spontaneous triceps injury is an uncommon injury with a reported incidence of less than 2% of all tendon injuries. The various pre-existing associated conditions that have been identified. The injury is often missed initially due to its rarity, lack of external trauma and hence a low index of suspicion. We present a similar case of a spontaneous triceps rupture here, its diagnosis and management algorithm.

Track: Wrist fractures and injuries

P-06 Comparison between dorsal and palmar vascularized bone graft for treatment of scaphoid non unions

Information about abstract submitter

1) Davide Smarrelli, HUMANITAS, HAND SURGERY DPT, Italy*

The main content of abstract:

Objective
Assessing retrospectively outcome between dorsal (1-2 ICSSR and 3-4 ICSSR) and volar (Kuhlmann and Mathoulin-Haerle) vascularized bone graft from distal radius, matching clinical results, time of achieved union, fixation device and complications. We named group A patients with dorsal bone grafts (1,2 and 3,4 ICSSR) and group B with palmar grafts (Mathoulin-Haerle and pronator quadratus).

Methods
12 patients treated with palmar grafts and 14 with volar grafts performed between 2008 and 2017, were reviewed. The choice of graft was based on anatomical site of nonunion. Inclusion parameters were same surgeon, scaphoid nonunion, failure of previous scaphoid fixation. Osteosynthesis was obtained by Kirschner wires or screw. After surgery wrist was embraced for 8-12 weeks, depending on radiological findings, then mobilization was achieved. Xrays were performed after 8, 12, 16 weeks or furtherly if needed. Outcome was evaluated by clinical examination, patient's perception with scaphoid score, MAYO WRIST SCORE, VAS, ROM

Results
In group A, we had 3 failures.In group B, we observed 2 failures;1 infection in volar group. 2 mild infection in both groups spontaneously recovered. In group A 6 grafts were fixed by K-wires and 6 with screw; in group B, 6 grafts were fixed with K-wires, 8 with screw. Radiological mean healing after 3 months, within a range from 2 and 10 months, with shorter time obtained by screw fixation, within 8-12 weeks from surgery ($p<0,05$) Mean MWS in group A was from 46 points to 70, while in group B was from 46 points to 78. Clinical healing was seen on between 2- 8 months in order to pain relief, ROM,functional recovery, better in group B.

Conclusions
We obtained better results in order of clinical healing and ROM with palmar bone graft. Even more challenging and more technically difficult, we prefer to perform palmar bone graft, related to better outcome. Furthermore, we observe quicker healing with screw fixation.

Brief description of the abstract
This study assess retrospectively the outcome between 12 dorsal (1-2 ICSSR and 3-4 ICSSR) and 14 volar (Kuhlmann and Mathoulin-Haerle) vascularized bone graft from distal radius, matching clinical results, time of achieved union, fixation device, complications.patients were operated on between 2008

and 2017. Osteosynthesis was obtained by K- wires or screw. We obtained better results in order of clinical healing , ROM, function with palmar bone graft and faster healing with screw fixation.

Track: Other

P-07 Aesthetic and functional reconstruction alternative for the treatment of in situ melanoma of the nail matrix

Information about abstract submitter

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The main content of abstract:

Objective
Classically, wide local excision with distal phalange amputation is the first-line treatment for nail melanoma. Currently, less invasive techniques are advocated with the preservation of bone, especially in early stages. These have not shown greater recurrence or decreased survival. Several reconstructive techniques have been described with acceptable results. We report a case of in situ melanoma in the nail matrix managed with excision of nail apparatus, preservation of distal phalanx and coverage with local flaps.

Methods
A 28-year-old caucasian woman, with no relevant background, presented longitudinal melanonychia in the right-hand little finger nail plate with a long term private follow-up as nevus of the nail matrix. After widening of the band, a matrix biopsy was performed, reporting an in-situ melanoma. She was referred to our department for wider excision and follow-up. At the pre-surgical examination, a scar of biopsy was evidenced and in the nail plate there was a longitudinal and heterochromatic melanonychia of 3 mm of uniform width. The dermoscopy showed heterochromic brown bands of different width, as well as spaces of different amplitude.

Results
The nail apparatus was removed, preserving the distal phalanx and extensor apparatus. For the coverage, a double advance flap (one volar and another dorsal) was designed, plus a radial transposition flap. The patient had a good post-operative evolution. The pain was mild and there were no other complications during the healing process. Histology showed scarring fibrosis without evidence of malignancy. After 24 months of follow-up, there has been no recurrence or progression of the disease, and patient aesthetic and functional satisfaction were achieved.

Conclusions
In the literature, the full-thickness graft is described as the usual coverage technique, although good results are also reported after closure by second intention. We carry out an alternative to the classic coverage technique with good functional and aesthetic results.

Brief description of the abstract
We report a case of a 28-year-old woman with an in-situ melanoma of the little finger nail matrix. The nail apparatus was removed preserving the distal phalanx and extensor apparatus. For the coverage, we carry out an alternative to the classic technique with a double advance flap, plus a radial transposition flap. After 24 months of follow-up, there has been no recurrence or progression of the disease, and patient aesthetic and functional satisfaction were achieved.

P-08 Hubbert-little opponensplasty for the management of type II thumb hypoplasia

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The main content of abstract:

Objective
Thumb hypoplasia is one of the most challenging pathologies in pediatric hand surgery. Its wide spectrum of presentation and the inherent difficulties with the pediatric patient will determine the accurate diagnosis and approach taken for its treatment. We report a case of thumb hypoplasia type II of the Blauth Classification managed with the Abductor digiti minimi opponensplasty (ADMO) described by Hubbert and Little.

Methods
A 5-year old male, right handed, was sent from the pediatric outpatient area with suspected diagnosis of mild thumb hypoplasia based on difficulties of manual activities for his age. His only previous history was a developmental delay caused by GH deficit with no other associations. Physical exam showed a narrow first web space, absence of the thenar muscles and laxity of the ulnar collateral ligament (UCL) of the metacarpophalangeal joint. No other soft tissue abnormalities were addressed. Radiographic images showed normal skeletal development.

Results
Based on Blauth classification (Type II) we decided a first web four corner Z-plasty, an ADMO as described by Hubbert and Little, with reinforcement of the UCL. All wounds were closed with reabsorbable sutures. A commissural plaster on the first web space was applied. Immobilization was removed after five weeks with no soft tissue complications. Institutional hand therapist protocol was begun at that time. Three-month post operation aesthetic look was acceptable, improvement of the thumb to index pinch was evident. Some degree of MCP stiffness was addressed with no functional impact at the time of evaluation.

Conclusions
The results for thumb reconstruction for type II hypoplasia are difficult to compared mainly because the severity of the hypoplasia and reconstructive technique used. We preferred an ADMO as described by Hubbert and Little because of the relatively easy reproducible technique and aesthetic improvement of the thenar region. A good preoperative plan and a realistic expectation of family members will determine the functional outcome reached by these patients.

Brief description of the abstract
We report a case of a 5-year old male with type II thumb hypoplasia managed with the ADM opponensplasty described by Hubbert and Little. A first web four corner Z-plasty, and a reinforcement of the UCL were also performed. Immobilization was removed after five weeks with no soft tissue complications. Three-month post operation aesthetic look was acceptable, improvement of the thumb to index pinch was evident. Some degree of MCP stiffness was addressed with no functional impact.

P-09 Anatomical Considerations for Endoscopic Carpal Tunnel Release in Distal Radius Fractures

Information about abstract submitter

1) Dawn Chia, Tan Tock Seng Hospital, Singapore*

The main content of abstract:

Objective
Distal radius fractures may distort carpal tunnel anatomy, and are a relative contraindication to endoscopic carpal tunnel release (eCTR). This study aims to evaluate the anatomical considerations of eCTR in patients with previous distal radius fractures, and compare the use of open release (OCTR) and eCTR in these patients.

Methods
This is a retrospective study conducted in a tertiary hospital between May 2008 and May 2018. This study included all patients aged above 16, with a history of distal radius fractures, who underwent CTR. Parameters studied included patient biodata, risk factors for CTS, AO classification and treatment of the fractures, as well as CTR treatment outcome. Statistical analysis was conducted using the chi-squared test.

Results
Among 1123 patients who underwent CTR, 41 had a history of ipsilateral distal radius fracture. Of these, 68.3% underwent OCTR, and 31.7% underwent eCTR. 61.5% of the eCTR patients had their fractures treated conservatively, while 74.1% of the OCTR patients had open reduction and internal fixation (ORIF). Radiological parameters post-fracture-healing achieved an average volar tilt -2.6°, radial height 8.49mm, radial inclination 17.2°, and ulnar variance -0.28°. Post-eCTR, all patients experienced improvement in CTS symptoms at final follow-up. The post-operative results of both the eCTR and OCTR patients were comparable.

Conclusions
We recommend that eCTR can be used in the treatment of patients with previous distal radius fractures who present with CTS.

Brief description of the abstract
Our study focuses on patients with carpal tunnel syndrome and ipsilateral distal radius fractures. These patients constitute an important group, as carpal tunnel syndrome is a common complication of distal radius fractures. Yet the distal radius fracture is considered a relative contraindication to ECTR, due to its effect on carpal tunnel anatomy and risk of poor visualization on endoscopy. We study the use of ECTR in this group of patients, and show that ECTR is a safe procedure.

P-10 The Bi-leaflet Thenar Flap – A Modification for Primary Donor Site Closure

Information about abstract submitter

1) Yong Chiang Kang, Singapore General Hospital, Singapore*

The main content of abstract:

Objective
The thenar flap is a time-proven flap in fingertip resurfacing, providing glabrous skin with minimal donor site defect. In our experience, the classic thenar flap is easy to raise in the first stage, but often require deliberate second stage division to restore donor site contour. We present a modification the thenar flap to circumvent this issue.

Methods
We present a modification the thenar flap as two leaflets, with design based on a ellipse. Permutation of leaflet design skew the orientation of raised flap to suit the recipient defect. Differential stitching allow primary closure of the defect to an aesthetic curvilinear wound, parallel to the thenar crease. The ensuing flap division simply involves truncation of the bases of both leaflets along the arc of the healed wound.

Results
Photographs and illustrations of the technique and outcome is presented. The surgery is technically easy and fast to perform. Most of the donor site over the thenar eminence is closed primarily, with a simplified second stage flap division. Flap and donor site healing are excellent.

Conclusions
The technique enables varied flap orientation and simple division. It enhances the aesthetic outcome of the donor defect.

Brief description of the abstract
The thenar flap as a reliable and simple flap for fingertip resurfacing is enhanced through this bileaflet modification.

P–11 The Thenar Crease Skin Graft: a novel addition to 'Camouflage' grafts of the Hand

Information about abstract submitter

1) Yong Chiang Kang, Singapore General Hospital, Singapore*

The main content of abstract:

Objective
Palmar skin defects of the hand are common. When wound conditions are favorable, glabrous skin grafting provide ideal resurfacing -- simple, predictable, and great aesthetic outcome. Glabrous skin grafts are however confined to small sizes from limited donor sites.

Methods
We present two cases of harvesting the graft from the thenar crease to primarily resurface (case 1) degloving injury of the finger and (case 2) complete pulp skin loss.

Results
Graft size is up to 75mm by 7mm, yet donor site is easily opposed. We further report the operative experience, functional and aesthetic outcome, and provide insights to the refinement of technique.

Conclusions
The technique is fast, versatile, and provides good quality glabrous skin in a single stage procedure. It will sit well in the armamentarium of the hand surgeon.

Brief description of the abstract
The authors illustrate 2 cases of a novel technique of harvesting full thickness skin grafts from the thenar crease, and report with photographic evidence the outcome of the cases. They further provide insights to this technique so benefiting surgeons may adapt the technique to a variety of clinical scenarios.

P-12 Reconstruction of digital soft tissue defect: Optimal options and refinements

Information about abstract submitter

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The main content of abstract:

Objective
Reconstruction of soft tissue defect of digits can be challenging due to functional and aesthetic issues. Recently, in consideration of joint stiffness and need of a good wound bed in skin graft or inappropriate location for local flap, free tissue transfer is emerging as an attractive option. Nevertheless, there is no consensus about ideal option. In this study, we present cases of free SCIP flap in reconstruction of single or two fingers with discussion for appropriate options.

Methods
Five patients with soft tissue defects greater than 2cm2 of the single or two fingers with extensor tendon exposure(Fig.1) were received free SCIP flap. After detecting the superficial and deep branch of superficial circumflex artery, suprafascial flap was elevated in the groin region(Fig.2). Dominant perforator was selected and anastomosed with the recipient such as digital artery(Fig.3).

Results
Flaps survived and during late postoperative period, there has been no complication. Three weeks after first operation, flap was divided in patients with the defect of two fingers(Fig.4). Contour was satisfactory aesthetically and total active motion was recovered over 80% postoperatively.

Conclusions
Reconstruction of the digital soft tissue defect requires thin and flexible tissue. Free tissue transfer is an appealing option in respect of prevention of joint contractures and applicability of the tissue, however, bulky flap including an adipose tissue disrupts functional and aesthetic reconstruction. SCIP flap could provide a relatively thin tissue compared with the others. Groin flap can be one of the optimal options for digital reconstruction supported by the supermicrosurgery technique of the surgeon.

Brief description of the abstract
Reconstruction of soft tissue defect of digits can be challenging due to functional and aesthetic issues. We report functional hand reconstruction with free SCIP (superfical circumflex iliac artery perforator) flap, and discuss about the feasibility of this surgical technique.

P-13 Selective peripheral neurectomy in the treatment for post-stroke spasticity: Our early experience

Information about abstract submitter

1) Pei Yein Tong, Khoo Teck Puat Hospital, Singapore*
2) Vaikunthan Rajaratnam, Khoo Teck Puat Hospital, Singapore

The main content of abstract:

Objective
Traditional surgical management of spasticity include orthopedic procedures such as musculotendinous

unit lengthening and tendon transfers. Selective peripheral neurectomy (SPN) is a relatively recent surgical modality in the treatment of post-stroke spasticity. Following the development of an outpatient care pathway for stroke patients with limb spasticity, two of our patients underwent SPN. We discuss the surgical techniques and present our early experience with SPN in post-stroke patients.

Methods
An outpatient multidisciplinary clinical care pathway has been developed. Domains of evaluation included patient's general cognitive ability, limb specific degree of spasticity and classification of limb function. A proposed algorithm is used by the team to suggest treatment options for patients. Surgical option of SPN is offered to patients with positive response to Botox injection. Surgical techniques of the procedure will be presented. Review was performed in the outpatient clinic during immediate post-operative period, at one month, and at 3months. Functional scores, degree of limb spasticity, and patient satisfaction are evaluated.

Results
12 patients have been reviewed under the proposed clinical pathway. 5 patients received Botox injection in this multidisciplinary clinic. 2 patients underwent surgery (selective peripheral neurectomy). Early results are encouraging. Reduction in tone, as quantified by improvement Modified Ashworth Scales has been achieved. Patients have also reported high satisfaction with their results.

Conclusions
We propose an outpatient clinical care pathway for adult patients suffering from spasticity of the limbs, and selective peripheral neurectomy as a useful technique in the treatment.

Brief description of the abstract
Selective peripheral neurectomy is a relatively recent surgical modality in the treatment of spasticity. Following the development of an outpatient care pathway for stroke patients with limb spasticity, two patients underwent selective peripheral neurectomy for their upper and lower limbs. We will discuss the surgical techniques and present our early experience.

P–14 Pilar cyst of thumb: Rare presentation of a common cyst

Information about abstract submitter

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The main content of abstract:

Objective
Cystic lesions of the skin are one of the most common lumps involving the skin and adnexal tissue. Pilar cysts are trichilemmal cysts, that arise in areas of high follicular density with occasional reports of them being found at back, vulva, nose, mons pubis, buttock, wrist, chest, elbow, or eyes. We present a case of pilar cyst in an extremely rare location.

Methods
A 79 year old lady presented with a lump in her left thumb which had been present for a few months. On examination it was a small 1 by 1 cm lump proximal to the base of the nail, over the dorsal aspect of the distal phalanx of the left thumb. It had been slowly growing with no history of discharge or infection. She was referred as a possible differential diagnosis of mucoid cyst, epidermoid cysts or squamous cell carcinoma. An X-ray was also done, which did not show any bony spur. We did an excision of the lesion under local anaesthesia. The procedure was uneventful and the lesion could be easily dissected from the surrounding tissue.

Results
The histopathology evaluation was suggestive of a cystic lesion lined by squamous epithelium and suggestive of an inflamed pilar cyst. There was no recurrence at her 3 month follow up and the operative site had healed well.

Conclusions
In conclusion, Pilar cysts can arise in unusual locations of the body, even where they are devoid of any hair follicles. They are mostly preceded by some trauma, which may not always be documented. The need to rule out the possibility of proliferating pilar tumours is essentially, since they have a rare risk of malignant transformation.

Brief description of the abstract
A 79 year old lady presented with a lump in her left thumb which had been present for a few months. On examination it was a small 1 by 1 cm lump proximal to the base of the nail, over the dorsal aspect of the distal phalanx of the left thumb. She was referred as a possible differential diagnosis of mucoid cyst, epidermoid cysts or squamous cell carcinoma. We did an excision of the lesion under local anaesthesia. . The histopathology evaluation showed a pilar cyst.

P–15 Pyoderma gangrenosum of a finger: a difficult diagnosis

Information about abstract submitter

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2) Kavish Maheshwari, Bedford Hospital, United Kingdom
3) Andrew Pinto-Hart, Bedford Hospital, United Kingdom

The main content of abstract:

Objective
Pyoderma gangrenosum is a known great mimicker of cutaneous infective diseases. Its appearance and fulminant course usually prompts urgent surgical intervention in most clinical scenarios and it is mostly in hindsight that a diagnosis of pyoderma gangrenosum is made, usually in light of lack of clinical improvement and worst still, worsening of the condition

Methods
We present a case of a gentleman who presented with a spontaneous episode of swollen and an extremely tender finger, with bullous lesions, erythema, and a clinical picture suggestive of a necrotising infection but no tenderness over the flexor sheath. He has significant history of ulcerative colitis and on azathioprine for the same.

Results
We proceeded with an initial debridement followed by empirical intravenous antibiotics. Clinically, much improvement achieved. However, three days following stopping his immunosuppressive treatment he had a severe episode of spreading cellulitis and pyrexia. A second debridement was performed and an urgent gram stain microbiological samples showed no growth.Tissue samples were sent for histology as well. Steroids therapy was started which showed remarkable improvement and his finger healed remarkably without the need for any procedure for wound coverage.

Conclusions
Pyoderma gangrenosum is a diagnosis of exclusion and a disease of contradictions. There are numerous case reports which all have one thing in common and that has been a diagnosis in hindsight. It is very difficult to withhold antibiotics and embark upon steroids on first encounter with this condition, as demonstrated by most case reports. Low threshold must be kept for this condition, especially in patients with known risk factors, even though most patients would still be started on antibiotics. This

maybe a reasonable path for the management of this misleading condition. A histological examination can objectively diagnose this condition.

Brief description of the abstract

This is a case of a gentleman who presented with a spontaneous episode of swollen and an extremely tender finger, with bullous lesions, erythema, and a clinical picture suggestive of a necrotising infection but no tenderness over the flexor sheath. He has significant history of ulcerative colitis and on azathioprine for the same. Potentially, a diagnosis of pyoderma gangrenosum was achieved. Pyoderma gangrenosum is a diagnosis of exclusion and a disease of contradictions.