



BSSH

The British Society for
Surgery of the Hand

Autumn Scientific Meeting

20–21 October 2011

ONE GREAT GEORGE STREET
LONDON



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BSSH

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Surgery of the Hand**

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OUTLINE PROGRAMME

THURSDAY, 20 OCTOBER

- 08:15 Registration and Refreshments
08:50 Welcome by the President
09:00 Free Paper Session
11:05 Refreshments and Trade Exhibitions
11:35 Free Paper Session
13:10 Lunch and Trade Exhibitions
14:10 Symposium: Nerve Repair – The Future
16:10 Refreshments and Trade Exhibitions
16:40 Douglas Lamb Lecture:
Evaluating the outcome of experimental nerve repair – Professor T Brushart, Baltimore, USA
19:15 Society Dinner
Cruising down the Thames on the Symphony

FRIDAY, 21 OCTOBER

- 08:30 Registration
09:00 Annual General Meeting
(open to Members and Associates only)
09:40 Dupuytren's Symposium
10:25 Free Paper Session
11:00 Refreshments and Trade Exhibitions
11:30 Keynote Lectures:
Dupuytren's: What trials need to be done? – Professor P Werker, Groningen, Netherlands
Allotransplantation – Dr A Bishop, Rochester, USA
12:20 Hunterian Lecture:
Acute scaphoid waist fractures – Prediction of outcome with non-operative treatment
Professor T R C Davis, Nottingham
13:00 Lunch and Trade Exhibitions
13:55 Presidential Hand-over
14:00 Presentation by the Poster Prize Winner
14:05 Keynote Lecture:
Vascularised bone grafts to the upper extremity
Dr A Bishop, Rochester, USA
14:25 Free Paper Session
16:05 Debates and Voting:
How can we raise the status of hand research in the UK
17:00 Close of Meeting

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THURSDAY 20 OCTOBER

08:15 Registration and Refreshments

08:50 Welcome by the President

FREE PAPER SESSION

Chairmen: Mr I S H McNab/Miss S M Fullilove

09:00 **A randomised prospective clinical trial comparing treatment of distal radius fractures with volar locking plate and conventional percutaneous methods**

Miss A Karantana, Mr N Downing, Mr M Hatton, Professor C Moran,
Professor B Scammell, Mr A Taylor, Professor T R C Davis (Nottingham)

Aim: To compare the outcome of distal radial fractures after treatment with either a volar locking plate (DVRO) or percutaneous K-wires +/- spanning external fixator.

Methods: This was a pragmatic surgical randomised controlled trial with the intention to analyse treatment. Patients were randomised to treatment by the senior surgeon with either a volar locking plate or percutaneous K-wires +/- spanning external fixator. The inclusion criteria were:

1. Skeletally mature adults with no concomitant systemic disease, previous associated fractures of either arm or pre-existing radiographic abnormality.
2. Fracture of the distal radius which was dorsally displaced, extra-articular (with or without an undisplaced intra-articular component) with dorsal cortical comminution OR displaced intra-articular with an articular step or gap of >2mm.

The main outcome measure was the Patient Evaluation Measure hand function questionnaire. Additional measures included the QuickDASH score, the EQ-5D standardised health status measure, grip strength and range of motion. The level of significance was set at $p < 0.01$.

Results: One hundred and thirty participants aged 18 to 73 were randomised (plate $n=66$, control $n=64$). Follow-up was 95% at one year. Groups were balanced. The plate group had significantly better functional scores and range of motion at six weeks ($p < 0.001$). There was no difference at three months or one year. Grip strength was significantly better for the plate group at six weeks ($p < 0.001$) and 3 months ($p < 0.001$), but not at one year.

Conclusion: Use of a volar locking plate resulted in a faster early recovery of function. However, there were no significant differences at later follow-up.

09:08 Discussion

09:13 **The role of MRI in acute wrist injuries**

Mr K Asaad, Dr C Yvon, Mr C Smith, Miss N Darhouse, Mr M James (London)

Introduction: Wrist pain is a common presentation to the emergency department (ED). Interpretation of radiographs can make it difficult to reach a diagnosis. We present a series of patients with pathology that would be missed on plain X-ray alone.

Patients and Methods: Two hundred and fifty-one patients presented to our open access emergency wrist pain clinic between 2008 and 2010. Most were discharged from ED without a diagnosis. Presenting complaints included falls, sports injuries and insidious onset of pain. Highly specialised hand therapists assessed patients, using a 5-zone approach. Clinical suspicion of ligamentous damage or occult fracture led to further imaging.

Results: One hundred and thirty-four patients underwent X-ray and further imaging. One hundred and thirteen X-rays were reported as normal. These patients went on to further imaging, including MRI, CT and ultrasound scans. Nineteen of these scans were reported as normal. 85.8% of patients had pathology not detected on X-ray. These included TFCC tear 20.1%, de Quervain's 10.4%, fractures 9.7% and ulna abutment 3%.

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Conclusions: A significant number of wrist injuries may be missed using plain X-rays alone. Further imaging modalities are necessary. Early MRI of wrist pain following normal X-rays prior to specialist hand surgeon opinion may streamline patient treatment.

09:18 Discussion

09:21 Long-term outcome of perilunate dislocations and fracture dislocations

Mr S Kakar, Dr B Yuan, Dr P Rhee, Dr D Jones, Professor S Moran (Rochester)

Hypothesis: Patients sustaining perilunate dislocations and fracture dislocations experience impaired functional outcome with associated radiographic deterioration over time.

Methods: A retrospective review was conducted, analysing the outcome of all perilunate dislocations and fracture dislocations treated within our institution from 1985 to 2009. Standardised post-operative assessments included wrist range of motion, grip strength and Mayo Wrist Score.

Results: Ninety-four patients were treated within our institution over the last twenty-five years. There were thirty perilunate dislocations and 64 fracture dislocations (5 open and 89 closed injuries). Complete radiographic records were present in fifty-seven patients and included 20 perilunate dislocations and 37 fracture dislocations (4 open and 53 closed injuries). The fracture dislocation group tended to have improved flexion to extension arc compared to the purely ligamentous injury patients. Thirty-three percent of patients underwent additional secondary procedures. The pure dislocation patients went onto a higher rate of salvage procedures compared to the fracture dislocation patients (35% versus 5%). According to the Mayo Wrist Scores, 23% of patients had good to excellent results and at final follow-up, only 59% of patients returned to work indicating the significant morbidity associated with this injury. Radiographic analysis demonstrated signs of degenerative changes in both injury groups (35% dislocation only and 52% fracture dislocation patients). This may have been attributable to difficulties in maintaining the lunate within its fossa.

Conclusion: Perilunate dislocations and fracture dislocations result in significant morbidity and impaired functional outcome in patients over the long-term.

09:29 Discussion

09:34 Outcomes of ulnar head replacement

Mr S Kakar, Dr R Swann, Dr K Perry, Professor A Shin, Professor S Moran (Rochester)

Aims: To determine the outcome of ulnar head endoprotheses in the treatment of distal radioulnar joint (DRUJ) instability and arthrosis.

Methods: A retrospective review was conducted, analysing the outcome of all ulnar head prosthesis implanted within our institution over a ten-year period. All patients presenting complained of pain and functional disability due to instability or arthrosis of the DRUJ. Standardised pre-operative and post-operative assessments included a patient rated pain score, forearm range of motion, grip strength and Mayo Wrist Score. Pre-operative and post-operative radiographs were examined for final position, loosening and osteolysis.

Results: Sixty-nine patients were followed for a median of 49 months (range: 16 to 126 months). Eighty-nine percent of prosthesis were uncemented. Pain scores decreased from 4.7 (± 1.7) to 2.5 (± 1.9) and the mean Mayo Wrist Score improved from 41 ± 8 points to 67 ± 13 after surgery. Kaplan-Meier analysis demonstrated 81% survival at six years. Thirty-two percent of patients required additional surgical procedures after primary ulnar endoprosthesis placement.

Conclusions: Distal ulna arthroplasty is capable of improving pain and function in patients with DRUJ instability or arthrosis. One third of patients, however, required additional surgical procedures after primary ulnar endoprosthesis placement.

09:39 Discussion

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09:42 Fixation of unstable distal radius fractures with the distal volar radius plate

Mr G Cheung, Miss L Wilson, Mr D Miller, Mr C Meyer, Mr C Kerin, Mr D Ford (Derby)

Introduction: Volar locking plates provide stable fixation using the fixed angle device principle. We present our experience from the first two hundred and fifty-eight patients performed at this institution.

Method: All patients in whom a distal volar radius (DVR) plate was used for an unstable distal radius fracture between August 2005 and February 2008 were recruited. Two hundred and fifty-eight consecutive patients were identified, six had bilateral fractures. Patient records were reviewed, and each patient contacted via a questionnaire and Patient-Rated Wrist Evaluation (PRWE).

Results: Of the two hundred and fifty-eight patients, 187 responses were received (72.5%). The mean follow-up was 31.8 months. The mean age of the patients was 43.8 years. The mean inpatient stay was 1.6 days. The median PRWE was 4. One hundred and four of the patients had a PRWE of =5. Ninety-four out of 99 patients (95%) returned to the same job at a mean of 5.8 weeks.

There were sixteen complications. Six patients had extensor tendon irritation, of which two patients required tendon reconstruction. One further patient had a spontaneous EPL rupture. Five (2.7%) patients had median nerve symptoms post-operatively. Two patients developed CRPS. One patient developed a minor wound infection and one had peg penetration into the joint. Eleven patients had removal of metalwork.

Discussion: Our results show that the DVR plate can be used reliably with an early return to high levels of function and work with a low complication rate. This is the largest series of the use of this volar locking plate to date.

09:47 Discussion

09:50 Union rates following proximal scaphoid fractures - Meta-analyses and review of available evidence

Mr N Eastley, Mr H Singh, Dr N Taub, Professor J J Dias (Kettering)

Introduction: There is little published on the management of acute proximal scaphoid fractures. Worry of avascular necrosis has led to a tendency towards early surgical fixation. We performed a meta-analysis, comparing union rates of non-operatively managed acute proximal pole scaphoid fractures with acute fractures elsewhere in the scaphoid, to investigate the magnitude of non-union.

Methods: Electronic databases were searched for relevant articles. Titles and abstracts highlighted were reviewed with their bibliographies and relevant articles obtained for full text review. Authors' assorted definitions of the scaphoid's proximal pole and union were accepted.

Results: Our search yielded seventy-nine potential publications, of which ten met eligibility criteria. Three investigated union after surgery and seven reported union after non-operative management. The total number of acute proximal pole fractures reported was eighty-eight; 40 managed operatively and 48 non-operatively. Meta-analysis revealed a pooled odds ratio for non-union of 9.2 for proximal fractures compared to fractures elsewhere in the scaphoid (95% CI:4.5-18.6; $p < 0.001$). The pooled relative risk was 6.3 (95% CI3.8-10.2 $p < 0.001$). Meta-analysis comparing non-union of operatively and non-operatively managed acute proximal fractures was attempted, but too few proximal pole fractures were reported.

Conclusions: There is a clear association between acute proximal scaphoid fractures and non-union shown by the pooled odds ratio calculated. Literature suggests surgical management of acute proximal fractures may reduce this risk. Retrograde compression screw fixation following open or percutaneous K-wire stabilisation appears a safe technique for such cases. Future work should compare union of acute proximal pole fractures when managed surgically and conservatively.

09:55 Discussion

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09:58 **Assessing outcome following distal radial fractures - A simplified approach**
Mr J Field, Mr D Buchanan, Mr D Pothero (Cheltenham)

Introduction and Aims: Outcome following wrist fractures is difficult to assess; simply asking the patient for their level of satisfaction may not be enough. A study was designed to determine which wrist scoring system best correlates with patient satisfaction and functional outcome and which individual variables predict a good outcome.

Material and Methods: We looked at fifty wrist fractures at 12 weeks post injury and compared their level of satisfaction with various respected outcome measures (Gartland and Verley, Sarmiento, Cooney, Patient-Rated Wrist Evaluation, Hand Function Score, and Disability of Arm Shoulder and Hand Score). Forty-five females and 5 males with a mean age of 66 years (range 19 to 93 years) were included in the study. Multivariate regression analysis was carried out, using SPSS 17.

Results: Patient satisfaction correlated best with the MacDermid, Watts and DASH scores. The variables in these scoring systems that predicted satisfaction were pain, ability to perform household chores or usual occupation, open packets and cut meat.

Conclusions: The McDermid, Watts and DASH scores provide a better measure of patient satisfaction than the Gartland and Verley, Sarmiento and Cooney scores, however, they are all time consuming, complicated and may indeed not be necessary. The four most important questions to ask in the clinic following wrist fractures are about severity of pain, ability to open packets, cut meat and perform household chores or usual occupation. This may provide a simple and more concise means of assessing outcome after distal radial fractures.

10:03 **Discussion**

10:06 **Patient-reported outcome sixteen months after an undisplaced distal radius fracture**
Mr M Jones, Professor T R C Davis (Nottingham)

Aim: To evaluate the incidence and severity of wrist symptoms more than one year after an undisplaced distal radius fracture.

Method: All patients treated for an acute, undisplaced distal radius fracture at Queen's Medical Centre, Nottingham, between October 2009 and February 2010 were identified from plaster room records and radiographs. The exclusion criteria were: fracture manipulation or operative fixation, skeletal immaturity and age over 75 years. A modified Patient Evaluation Measure (PEM) questionnaire was sent to each patient to evaluate the significance of any wrist symptoms still experienced by the patients more than one year post-injury. The patient responded to each question with a score from 1 (no symptom) to 7 (severe symptom).

Results: Two hundred and three patients met the inclusion criteria. One hundred and thirty-six (67%) returned their questionnaire. Thirty-eight (28%) were male. Mean follow-up was sixteen months (range 14-19). Mean scores for every point on the PEM were 2/7, except grip strength (3/7). 33% scored >5 for at least one point on the questionnaire. There was no difference in the age or sex ratio between those with severe symptoms and those without.

Conclusion: Most patients have no symptoms or only mild symptoms sixteen months after an undisplaced distal radius fracture, but some still have pain and dysfunction. This study illustrates what patients can expect in the medium term following such a fracture and sets a benchmark for what should be expected after "ideal" treatment of displaced fractures of the distal radius.

10:11 **Discussion**

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BELL SESSION

10:14 **Fragment specific fixation for the distal radius - A tertiary referral model**

Mr G Becker, Mr J Ward, Miss S Mee, Miss K Owers (London)

Aim: To audit the results of fragment-specific distal radius fracture fixation in a tertiary referral hand and wrist unit, and to assess the workflow.

Methods: The trauma implant book was used to identify all patients who had unilateral distal radius fracture fixation from July 2007 to January 2011. PACS was used to classify the fractures, and the medical and therapy records used to identify patient demographics. All patients at more than twelve months post surgery were invited back for clinical assessment and to complete DASH and patient related wrist evaluation (PRWE) questionnaires.

Results: One hundred and fifty-one patients were identified. 78% were classified as AO C2 or C3. One hundred and fifteen had a pre-op CT scan. The mean age was forty-four (18-85). All patients were fixed with Synthes 2.4mm locked plates. The majority had volar plates, but forty-six had dorsal and/or radial styloid plates as part of their treatment. There were roughly equal numbers of referrals from external hospitals and our own orthopaedic department.

The average time from surgery to late follow-up was twenty-four months. Average deficits between injured and non-injured sides were: flexion 11°, extension 8°, pronation 2°, supination 5° and the reduction in grip strength was 12%. Average PRWE score was 15, and the DASH 14.

Conclusions: Fragment specific fixation surgery from either a volar or dorsal approach provides results comparable to other published distal radius studies using volar locked plates alone; this is in spite of our cohort having significantly more severe fracture characteristics than most published series.

10:16 **Results of combined Herbert screw fixation and pedicled vascularised bone grafting from dorsal distal radius for management of scaphoid non-union**

Associate Professor M Quolquela (Egypt)

Introduction: Scaphoid non-union is treated by bone grafting and internal stabilisation of fragments. It was suggested that a combination of rigid fixation, using Herbert screws and pedicled vascularised bone grafts from the dorsum of the distal radius, based on 1, 2 intercompartmental supra-retinacular artery (1,2 ICSRA), would yield higher healing rates than using K-wires.

Materials and Methods: Sixteen patients with an average age of 23 years with scaphoid non-union were treated. They had 20° average dorsi-flexion, 32° palmar flexion and 46% (of other side) grip strength. Hump back deformity (increased intra-scaphoid angle) was observed in five patients with 58.4° average radioscapoid angle. Four patients had a non-united proximal pole without evidence of avascular necrosis and the rest of them had waist non-union. The non-union site was curetted and a rectangular trough was fashioned across it. A bone graft matching the size of the trough was harvested from distal radius based on 1, 2 ICSRA. A Herbert screw was inserted from proximal to distal followed by graft placement. Wrist movements started within three weeks.

Results: The average follow-up period was twenty-five months. Patients had 38° average dorsi-flexion, 60° average palmar flexion and 78% (of normal side) grip strength. X-ray evidence of fracture healing was observed within seven weeks with an 87% healing rate. The Mayo Wrist Score improved from an average score of 55 points pre-operatively to 86 points post-operatively.

Conclusions: Vascularised bone graft combined with Herbert screw fixation for scaphoid non-union yielded better outcome than using K-wires as fixation means.

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10:18 Outcome of internal fixation of unstable comminuted olecranon fracture using one-third tubular anti-glide plating and tension band wiring

Associate Professor M Quolquela (Egypt)

Introduction: Using tension band wiring (TBW) in unstable (oblique or comminuted) olecranon fractures cause collapse at the fracture site. Plating alone is not good as: a thick compression plate is placed subcutaneously, poor screw purchase in cancellous olecranon and no effective compression as TBW does. Collapse of the unstable fracture with TBW can be prevented by adding a one-third tubular plate, fixed only to the ulnar shaft (anti-glide mode).

Material and Methods: Twenty-eight patients with unstable olecranon fractures were divided into two groups. Group 1 (13 patients with an average age of 25.3 years) was treated with one third plating and TBW, while Group 2 (15 patients with an average age of 29.7 years) was treated with hook plates. Through a posterior approach, a transverse drill hole was made in the ulnar shaft and a stainless steel wire was passed through it. A short one-third plate was fixed only to the shaft with no screws in the olecranon. Olecranon was reduced to shaft-plate construct and TBW was completed.

Results: Average follow-up was twenty-nine months. In Group 1, fractures healed within 5.1 months compared with 6.2 months in Group 2. Average flexion/extension arc was 116° in Group 1 compared with 98° in Group 2. Average hand grip was 92% of other side in Group 1 compared with 83% in Group 2. Mayo elbow performance score was an average of 93 points in Group 1 compared with 82 points in Group 2.

Conclusions: In unstable olecranon fractures, combined TBW and one third plating resulted in better clinical results than plating alone.

10:20 A network meta-analysis model comparing different treatment modalities in the management of scaphoid waist fractures

Mr A Qureshi, Mr T Ibrahim, Professor A Sutton, Professor J J Dias (Leicester)

Aims: To investigate the comparative effectiveness of different surgical and non-surgical treatments for acute undisplaced and minimally displaced scaphoid waist fractures, using a network model, in addition to traditional pair-wise meta-analysis of all published randomised controlled trials.

Methods: A network meta-analysis was used to simultaneously synthesise trials making different treatment comparisons with respect to the primary outcome of fracture union. The outcomes of odds ratio of fracture union, complications, range of motion, grip strength and scaphotrapeziotrapezoid and radiocarpal osteoarthritis were also determined through conventional pair-wise analysis of surgical and non-surgical treatments.

Results: Six studies were eligible, consisting of 228 patients with paired comparisons drawn from five different treatment strategies, forming a connected network. The network analysis demonstrated the “long followed by short thumb spica” as being the optimal treatment (probability 0.81), with both open and percutaneous screw fixation ranked jointly second (probability 0.15). Pair-wise analysis generated pooled odds ratio of fracture union favouring surgery, but this was not statistically significant (pooled OR: 2.36, 95%CI: 0.62, 8.9; p=0.207, I2=0%). Surgery was associated with an elevated risk of complications (OR: 6.96, 95%CI: 2.13, 22.73; p=0.001, I2=0%). None of the remaining pair-wise outcome comparisons achieved statistical significance.

Conclusions: This is the first reported utilisation of network analysis enabling stratification of outcomes for different surgical and non-surgical treatments in the orthopaedic literature. Its usefulness is exemplified by the current analysis, where heterogeneity with multiple treatment arms exists, but limited comparative estimates of effect do not allow for simultaneous comparisons between all treatments.

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10:22 Analysis of failed Van Straten LPM PIP prostheses

Dr T Joyce, Mr M Bone, Dr J Cunningham, Mr J Field (Newcastle upon Tyne)

Introduction: The two-piece Van Straten Leuwen Poeschmann, Metal (LPM) prosthesis was intended for the proximal interphalangeal (PIP) joints. However, failure rates of 29% after nineteen months were reported, alongside massive osteolysis. This led the BSSH to undertake an audit.

Materials and Methods: Three failed LPM titanium niobium (TiNb) coated cobalt chrome (CoCr) components were obtained - two distal and one proximal. All three components were analysed by environmental scanning electron microscope (ESEM). This analysis gave the chemical composition of the surface to determine if the TiNb coating was still intact. The distal components were analysed, using a ZYGO non-contact profilometer (1nm resolution) to determine the roughness average (RA) of the surface and the presence of scratches, pitting and other damage.

Results: ZYGO and ESEM images indicated that the surfaces of all components were heavily worn. On the articulating surfaces of both distal components unidirectional scratching was dominant. The ESEM chemical analysis showed that in some regions on the distal component the TiNb coating had been removed completely and in other areas it had been partially penetrated. Scratching was significant in removal of the coating while corrosion may also have been a factor.

Conclusions: It is likely that the osteolysis reported clinically was linked to the wear debris from the failed TiNb coating. Hand surgeons need to be aware of such failure modes, so that they appreciate limitations of different finger prostheses. No other analysis of ex vivo LPM prostheses has been reported in the scientific literature.

10:24 Discussion

10:29 Distal scaphoidectomy and radio-scapho-lunate arthrodesis using Herbert screws as a motion preserving procedure in radiocarpal arthritis

Associate Professor M Quolquela (Egypt)

Introduction: Arthrosis limited to the radio carpal joint is uncommon and is amenable to radio-scapho-lunate arthrodesis rather than total wrist fusion. The use of Herbert screws rather than K-wires was suggested, to increase compression at the fusion site. This enhanced healing and allowed early wrist movement to avoid stiffness. Resection of the distal scaphoid promoted motion at the midcarpal joint.

Material and Methods: Seventeen patients with an average age of 28 years, who had radio-carpal arthritis were treated. Nine wrists were rheumatoid, two wrists were villonodular synovitis and six wrists were post distal radial fracture. Average dorsi-flexion was 16° and average palmar flexion was 24°. Grip strength had an average of 35% of the contralateral side. Through a dorsal approach, the distal half of the scaphoid was resected, followed by cartilage debridement of the distal radius, proximal surfaces of lunate and remaining scaphoid. Two Herbert screws were inserted from the distal articular surfaces of lunate and scaphoid proximally, across the radiolunate and radioscapoid joints. Raw surfaces were packed with cancellous grafts from the iliac bone. Splinting for three weeks post-operatively was followed by gradual active wrist movements.

Results: The average follow-up period was twenty-three months. All patients reported no pain. Average dorsi-flexion was 27° and average palmar flexion was 30°. Grip strength had an average of 58% of the contralateral side. Joint fusion was confirmed radiologically within 8.6 weeks. The modified Mayo Wrist Score improved from an average of 48 points pre-operatively to 72 points post-operatively.

Conclusions: Radio-scapholunate fusion, using Herbert screws with distal scaphoidectomy yielded a mobile, strong, painless wrist.

10:34 Discussion

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THURSDAY 20 OCTOBER

- 10:37 **A study of the associated incidence and pattern of upper limb trauma in bilateral lower limb amputations in Op Herrick - An analysis of two hundred and twenty-one consecutive cases**
Wg Cdr A Pandya, Lt Cdr A Hicks, Surg Cdr P Coates, Sq Leader N Jacobs, Cdr J Hawker (Portsmouth)

Introduction: During two sequential deployments to Afghanistan, it was noticed that an inordinately high number of patients with bilateral lower limb injuries that resulted in amputations at Camp Bastion, had associated upper limb injuries. It was decided to study the incidence and distribution of the same.

Methods: This was both, a retrospective, as well as a prospective study. Of the two hundred and twenty-one cases, sixty eight were recorded and data collected prospectively, whereas the data for the rest was gathered using the patients' scanned records from Camp Bastion, their radiology reports and clinical photographs. Permission to gather and access this data was through the access of the Joint Theatre Trauma Registry provided by the Deputy Director of the Joint Combat Casualty Research Team (JC2RT) in Afghanistan and was also relayed to the US Army Institute for Surgical Research Fort Sam, Houston, Texas. Permission was granted to conduct this study as it would throw a light on the pattern of injuries and allow a further study of the impact of this on rehabilitation. This is an ongoing concurrent study.

Results: A total of two hundred and twenty-one patients were studied as described above. They included UK, NATO, US, ANA, ANP, EF and Afghan civilians. The cases were between June 2009 and January 2011. There were fifty-nine fatalities from these 221 cases. Data pertaining to these cases was discarded.

Data: Of the surviving one hundred and sixty-two cases, 31 cases had no upper limb involvement. A number of these individuals were subjected to an IED attack when mounted, although dismounted injuries still accounted for the vast majority. One hundred and thirty-one individuals had upper limb involvement of some sort or the other. The injuries were classified into anatomical distribution as well and the type of trauma (amputations, composite soft tissue, fractures, vascular, nerves etc). The predominance of the injuries was on the distal portion of the upper limb (i.e involving the digits, hands and forearm [digits and hands - 66 patients, wrist and forearm in 69 patients, elbow and arm in 42 patients]). The most common form of involvement was a composite tissue injury (involving skin, muscle and vessels/nerves) in eighty-one patients. Twenty-seven patients ended up as triple amputees by the time they left the Camp Bastion Role 3 Hospital.

Discussion: From the pattern and severity of injuries it is obvious that dismounted individuals presented with a very severe spectrum of injuries. The predominance of the left upper limb being involved is in keeping with a dismounted right handed soldier out on patrol with the left upper limb extended along the barrel of the rifle or his weapon. Using various cases (clinical photographs as well as radiographs) the spectrum of injuries is explained and a case is made for truly differentiating the debridement and radical treatment of upper limb versus lower limb trauma during initial surgery.

- 10:45 **Discussion**

- 10:50 **BSSH in Sierra Leone**

Miss B Jemec, Mr O Harley, Mr J Jones, Mr S Ankarath, Mr N Sarhadi, Mr R Murali,
Mr R Eckersley (London)

Sierra Leone has been ravaged by a vicious civil war, which ended ten years ago. They have been left with one hundred doctors, of which 10 are surgeons and one is an anaesthetist.

Together with ReSurge Africa, BSSH has sponsored teams going to the Holy Spirit Hospital in Makeni since late 2009. We have to date operated on more than a hundred hands and the hospital has become the national referral centre for hand surgical problems.

The project and selected clinical cases will be presented.

- 10:58 **Discussion**

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THURSDAY 20 OCTOBER

11.05 Refreshments and Trade Exhibitions

FREE PAPER SESSION

Chairmen: Mr S L Knight/Mr R H Milner

11:35 Is there a need for routine post-operative surgical follow-up, post trapeziectomy or single digit Dupuytren's fasciectomy, when a hand therapist follow-up appointment is already in place?

Mr S Elnikety, Mr M El-Husseiny, Mr T Kamal, Mr G Talawadekar, Miss H Richards, Miss N Triggs, Mr A Smith (Margate)

Introduction: A "no routine post-operative follow-up appointments" policy has been implemented in NHS hospitals in different specialties for uncomplicated surgical procedures. In trauma and orthopaedics few studies to date reviewed this practice and reflected on the patients' opinions.

Methods: A total of one hundred and twenty-one patients were recruited over two years for this study, each patient had post-operative follow-up by the hand therapist for three months. Fifty patients post simple trapeziectomy and 71 patients post single digit Dupuytren's fasciectomy, were prospectively surveyed for their opinion on their post-operative care and whether they would have liked to be reviewed by the surgeon in a routine post-operative follow-up appointment. All patients were reviewed by a hand therapist within two weeks post-operatively and treatment protocols were followed with all the patients.

Results: One hundred and sixteen patients completed the study, 5 post Dupuytren's fasciectomy patients were lost for follow-up. One hundred and six patients (91%) were satisfied with their post-operative management and 99 patients (85%) did not want to be reviewed by the surgeon in a post-operative outpatient follow-up appointment.

Discussion: This study reflects the successful application of "hand therapy led follow-up and discharge" policy with no routine post-operative review by the surgeon. We succeeded in reducing the waste in the NHS by avoiding at least two hundred and fifteen unnecessary routine follow-up appointments over a two-year period. By applying this policy we also succeeded in avoiding the inconvenience to patients having multiple trips to the hospital.

11:40 Discussion

11:43 A patient-reported outcome measure (PROM) study and cost analysis of one hundred patients using the wide-awake hand surgery technique in a dedicated hand unit

Miss I Teo, Mr W Lam, Miss P Muthayya, Mr S Alexander, Miss K Steele, Mr G Miller (Sheffield)

Introduction: The wide-awake hand surgery (WAHS) method was introduced by Lalonde (2007) as an innovative technique, obviating the need for general/regional anaesthesia and tourniquets for both elective and traumatic hand surgery. The technique involves injecting tumescent amounts of local anaesthetic with adrenaline for hand surgical procedures including digits. Potential economic savings include reductions in anaesthetic resources, decreased inpatient admissions and maximising theatre utilisation. This retrospective study reports our experience and patient-reported outcomes with the use of this technique in the Sheffield Hand Unit.

Methods: From 2009-2011, one hundred patients met the selection criteria with procedures such as elective trapeziectomy, cubital tunnel releases, Darrach's procedure, tenolysis and fasciectomy; procedures which traditionally require general/regional anaesthesia and tourniquets. Patient outcomes were evaluated using a novel questionnaire specifically designed and validated for patient experience during local or regional anaesthesia. Cost saving analysis for two common procedures was also performed.

Results: Overall, a 52% response rate was achieved, with the majority reporting a high satisfaction level; 88.5% experienced little/no pain during the procedure; 90% felt no anxiety intra-operatively; 55.8% reported less pain than a dental procedure; and 82.7% stated it as their preferred method. No adverse complications were encountered.

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Conclusions: This is the first UK-based PROM study which confirmed the safety, efficacy and patient popularity of the WAHS technique. Cost benefit analysis demonstrated that savings can be achieved, whilst improving quality of service. Current trials are underway to establish the organisational protocol for the integration of this technique for dedicated UK hand units.

11:48 **Discussion**

11:51 **Incidence of hand and upper limb involvement in children with cerebral palsy**

Mr M Nixon, Dr J Duodu, Mr A Bass, Professor P McArthur (Liverpool)

Introduction: Cerebral palsy (CP) has an incidence of one in 2000 live births, and despite a well described pattern of hand and upper limb involvement, the incidence of such contractures and how this relates to function has never been described.

Methods: One hundred consecutive CP patients attending non-hand related clinics were assessed for contractures, pain, cosmesis, hygiene, weakness and control of their upper limb. Function was assessed according to the GMFCS, MACS and Ablihand-kids systems and correlated to upper limb involvement.

Results: 83% of patients had some upper limb involvement. 43% of these had a contracture - most commonly wrist flexion (23%) or pronation (22%), followed by thumb in palm (22%) and finger swan necking (17%). 37% complained of poor hand control and 27% about the cosmetic appearance of their hand. The MACS score was strongly correlated to both the GMFCS ($r=0.7$, $p=0.001$) and the Ablihand score ($r=0.8$, $p<0.001$). The majority (54%) had had their upper limb problems managed only by a hand therapist, 14% by a surgeon and 2% by a paediatrician. 29% of patients had not had their hand problems specifically addressed.

Discussion: Hand and upper limb involvement in cerebral palsy is frequently overlooked, despite a high prevalence, detrimental affect on function and amenability to treatment.

Problem	N (%)
MACS classification	
1	13
2	33
3	16
4	19
5	19

Upper limb involvement	
Left	20
Right	22
Both	41
Neither	17

Principle problem	
Control of movement	31 (37%)
Cosmesis	22 (27%)
Pain	4 (5%)
Spasticity	4 (5%)
Weakness	4 (5%)
Contracture	3 (4%)
Not specified	12 (14%)

Contracture	
Any	36 (43%)
Wrist flexion	19 (23%)
Wrist pronation	18 (22%)
Thumb in palm	18 (22%)
Swan neck	14 (17%)
Elbow flexion	11 (13%)
Shoulder internal rotation	7 (8%)

Control of hand	
Normal	31
Restricted	60
No active control	9

11:59 **Discussion**

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12:04 Percutaneous fixation and bone grafting of paediatric scaphoid non-unions

Mr M Z Saeed, Mr N Goddard (London)

Scaphoid fractures are rare in the paediatric population and may result in non-union. The authors report a novel, minimally invasive percutaneous technique with bone graft, which results in satisfactory union of the fracture with minimal morbidity. We have treated four children (mean age 14.6 years) who presented with symptomatic un-united B2 fractures through the waist of the scaphoid. The pattern and extent of the non-unions were confirmed on CT scan. The fractures were fixed with a minimally invasive percutaneous technique with supplementary percutaneous autogenous bone grafting. The average operating time was thirty minutes. There were no intra-operative complications. The fractures healed at ten weeks. ROM, power grip, pinch grip and functional outcome were all excellent at three months review. There have been no cases of AVN or re-operation. We recommend this technique as an alternative to standard volar (Russe) bone graft in cases of scaphoid non-union in children.

12:09 Discussion**BELL SESSION****12:12 Surgeons are our greatest strength**

Mrs M Huber, Dr J Jupiter, Dr B Hanson (Dübendorf)

Aims: We compared surgeons' hand strength with normal data from the Swiss population. We also tested the external validity of a model proposed by Angst et al, which considers a number of factors such as age, gender, height, weight as well as occupational demands on the hand within our surgeon test group.

Methods: The inter-class correlation coefficient was used to compare observed values of grip and key pinch strength with those predicted by Angst et al.

Results: In total, four hundred and three surgeons of 62 different nationalities were interviewed and their grip and key pinch strengths were tested. Typical respondents were male surgeons, European, orthopaedic trauma residents, seven years in their current position and performing on average ten operations weekly. Surgeons' grip strength was on average 50kg (range: 22.3-90.0) compared to 41.5kg (range: 20.3-69.0) for the Swiss population ($p<0.001$). Mean key pinch strength was 9.9kg (range: 5.5-13.0) compared with 8.1kg (range: 4.2-13.0) for the Swiss population ($p<0.001$). The model of Angst et al was unable to predict grip strength with enough accuracy ($ICC=0.61$) and also failed in the prediction of key pinch strength ($ICC<0.01$). In addition to age, the best indicators of grip and key pinch strength are gender, height and weight.

Conclusion: Our data shows that surgeons were generally stronger compared to the Swiss population. However, the model of Angst et al did not support the external validity of our surgeon population.

12:14 Is there a demand for an upper extremity fellowship?

Mr S Kakar, Mr K Bakri, Professor A Shin (Rochester)

Hypothesis: One year of hand fellowship education is inadequate, based on the experiences of fellows having completed a fellowship.

Methods: Electronic surveys were sent to two hundred and forty-eight surgeons who had completed a hand surgery fellowship from 2008-2010. The survey was structured to ascertain whether there was a need for expanded education, encompassing the entire upper extremity.

Results: One hundred and thirty one surgeons responded to our survey (53%). Seventy-four percent were trained in orthopaedics, 16% in plastic surgery, and 10% in general surgery. Forty-eight percent of trainees were seeking shoulder and elbow training in their fellowship. Microsurgical experience was lacking with 8% of trainees not having performed a replantation, 23% not being involved in a free flap, 32% not participating in brachial plexus surgery and 17% not having done a vascularised bone graft. Forty percent of orthopaedically trained surgeons stated they did not feel competent in performing a replant, as opposed to 11% of plastic

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surgeons. In contradistinction, 94% of orthopaedic trainees felt comfortable treating a bone forearm fracture compared to 41% of plastic surgeons. When asked if they would have sought a two-year hand and upper extremity fellowship, 60% of candidates would have applied.

Summary: Based on the results of this survey, one-year of hand fellowship training has been perceived as inadequate in 60% of respondents, with focus lacking in shoulder and elbow, microsurgery, paediatrics and clinical research.

12:16 Driving whilst plastered: An objective assessment of driving safety in upper limb cast immobilisation
Miss H Stevenson, Mr S Dalal, Mr B Clift, Mr D Jenkins, Mr A Watts, Mr I A Trail (Wrightington)

Patients with upper limb cast immobilisation often seek advice about driving. Current guidelines are scant, and advice is provided by a variety of differing opinions and the preference of insurance companies. There are no set DVLA instructions, despite there being explicit rules on the management of other medical conditions. The police highlight the rule 79 of the Highway Code, stating “that it is the driver’s responsibility to ensure they are fit to drive”. Clearly, definitive guidance needs to be provided, both for the safety of road users and to standardise the advice that clinicians should be delivering for patient care.

Six individuals (mean age 36y, range 27–43y, 3 male, 3 female) were assessed for driving safety in different types of upper limb casts (above-elbow, below-elbow neutral and Bennett’s cast) on both left and right sides. They were formally assessed by two independent assessors - a mobility occupational therapist and a driving standards agency assessor/driving instructor - whilst completing a formalised driving competency test in a dual controlled car, over a thirteen mile circuit on public roads.

The results of the thirty-six driving assessments were statistically analysed, and revealed the majority of people were able to drive safely whilst plastered, particular with right sided cast immobilisation. Adaptive techniques were employed with left-sided below-elbow and Bennett’s casts but considered potentially safe. Driving in an left above elbow cast was considered unsafe.

12:18 Experience from a “one-stop” trigger finger clinic
Mr H Divecha, Mr J Clarke, Dr A Coyle, Mr S Barnes (Greenock)

Objective: To determine the accuracy of referring GP diagnoses and the efficacy of a series of two steroid injections, then surgery in the management of trigger fingers. Secondary objectives included assessing the influence of factors on the rate of recurrence following one steroid injection: injector grade (consultant/trainee), age, sex, grade of triggering, duration of symptoms, diabetes mellitus, rheumatoid arthritis and the presence of other upper limb “tendinopathies” (adhesive capsulitis, medial/lateral epicondylitis, supraspinatus/bicipital tendinitis).

Design: Outpatient based clinical audit with data collected prospectively.

Participants: Two hundred trigger fingers identified from September 2005 to November 2008, giving a minimum one-year follow-up.

Setting: A “one-stop” trigger finger clinic (based in a district general hospital), run by an upper limb consultant orthopaedic surgeon and a staff grade/orthopaedic specialist registrar.

Results: GP diagnoses were correct in 94% of referrals. Recurrence free resolution after one steroid injection was 73%, rising to 83% after a second injection. The grade of injector did not influence the rate of recurrence ($p=0.967$). Age was the only statistically significant factor, with recurrences being 8.3 years younger (95% CI 4.1 - 12.6yrs; $p=0.0002$). 15% required surgical release after failure of two steroid injections.

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Conclusions: Steroid injection for trigger finger is a safe, easily performed technique, that can give recurrence free resolution in up to 83% of patients, using a series of two steroid injections. This can be performed in the primary care setting, thus reducing the burden on hospital based specialist upper limb services, as only 15% required surgical intervention.

12:20 Lipomatous tumor of the digits, hand and wrist: A series of twenty-five cases and review of the literature

Dr P Ferrando, Ms E Katsarma, Dr J Weir, Mr L Garagnani, Mr R Eckersley (London)

Introduction: This retrospective study examines a series of twenty-five patients with lipomatous tumors of the digits, hand and wrist who presented to our hand surgery service between 2001 and 2009. Lipomatous tumors presentation in the digits, hand and wrist is infrequent; only small series of cases have been previously reported in literature.

Methods: Our series underwent pre-operative clinical and radiological evaluation. The most challenging cases were discussed at our multidisciplinary meeting before surgery. A marginal excision and histopathological examination were performed in all cases. Mean follow-up was nine months (range 3-24 months). Demographic data, medical/operative records, investigations, results of histopathological examination and follow-up data were recorded and reviewed.

Results: Histopathological examination confirmed that 92% (n=23) were benign lipomas, 4% (n=1) were fibrolipomatous hamartomas (FLH) and 4% (n=1) were well differentiated lipoma-like liposarcomas/atypical lipomatous tumors (WDLL/ALT). All patients with pain experienced resolution of the symptoms and acceptable range of motion was achieved in all patients with previous functional impairment each after tumor excision. All patients returned to routine activities. No recurrences were seen at follow-up.

Conclusion: Benign lipomas, FLH and WDLL/ALT localisation in the digits, hand and wrist is uncommon. This is one of the largest series described in the literature. A multidisciplinary approach for the assessment, diagnosis, pre-operative planning and treatment of these tumors is recommended. Choosing the most appropriate radiological investigation to delineate the anatomy of the lesion and its relationship with the surrounding structures is mandatory for a correct diagnosis and surgical management.

12:22 Discussion

12:27 Botulinum toxin improves symptoms and hand function in patients with Raynaud's syndrome secondary to scleroderma

Dr K Dhaliwal, Miss L Ovens, Professor P Butler (London)

Introduction: Scleroderma is associated with Raynaud's syndrome causing pain, paraesthesia, ulceration and gangrene. Botulinum toxin has been shown to improve digital perfusion in patients with Raynaud's. This is the first study to objectively assess hand function following this treatment.

Methods: Twenty patients were treated with 100 units of Botox injected into the hand. A hand assessment was performed prior to injection and then 8-12 weeks after. Outcomes assessed were change in pain, appearance, cold intolerance, pinch and power grip, range of movement and disability in daily activities (DASH score). A questionnaire at six months was also carried out.

Results: 80% of patients reported an overall improvement in their symptoms. 80% reported a reduction in pain, 75% an improvement in appearance and 65% improvement in cold intolerance. 90% showed an improvement in pinch grip and 65% an improvement in power grip. Three patients reported transient weakness. The majority had improved range of movement. 80% showed an improved DASH score (reduction in disability).

Conclusion: We have found botulinum toxin to be an effective treatment for Raynaud's syndrome secondary to scleroderma. The majority showed an improvement in their symptoms, it significantly improved their hand function and they would recommend the treatment to other patients.

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12:35 Discussion

BELL SESSION

12:40 **Can injection of intrinsic muscles of the hand be accurately undertaken without ultrasound scanning?**
Miss C Simpson, Professor P McArthur (Liverpool)

Aim: Injection of the small muscles of the hand is used regularly in the management of spasticity. The aim of this study is to determine whether an injection via a dorsal approach to the lumbricals and 1st web space muscles can be accurately performed without ultrasound guidance.

Method: An inexperienced operator was taught the technique of muscle localisation, then sited the injection as instructed. Using a dorsal approach and easily identifiable landmarks, a 23-gauge needle was introduced into each 1st web space, index, ring and little lumbrical muscles. Needle position was assessed by dissection. A successful "hit" was recorded if the needle tip was in the muscle or within 2mm of it.

Results: In thirty-two injections there were 27 (84%) direct hits and 5 within 2mm. Within the 1st webspace, the needle tip was in a safe corridor, 1cm or more away from the thumb radial digital nerve, and flexor pollicis tendon.

Conclusions: It is possible to accurately and safely use the described technique for injection of the small muscles of the hand via a dorsal approach without the use of ultrasound scanning. The technique is easily taught and learnt. Although this study is small, it has implications for patient comfort and suitability for use in the outpatient setting.

12:42 **Carpal tunnel syndrome: Local corticosteroids, conversion to surgery and NHS cost implications**
Mr B Miranda, Mr K Asaad, Ms S Cerovac (London)

Background: Carpal tunnel syndrome (CTS) treatments should provide predictable, rapid and cost-effective symptom improvement, an increasingly important consideration in the UK National Health Service today. The study aim was to investigate efficacy and cost-effectiveness of two main treatment pathways in patients with mild-moderate CTS: local corticosteroid infiltration versus surgical decompression alone.

Methods: A retrospective study of patients who attended clinic between December 2008 and June 2010 was undertaken, with an additional prospective follow-up period between October 2010 and February 2011. Patients were divided into two groups: those who received local corticosteroid injection (corticosteroid group) and those who were treated with surgical release only (surgery group).

Results: One hundred and forty-nine patients occupied 37% (429/1147) of clinic slots. One hundred and thirty-four patient notes were fully traceable and were studied over 22.5 ± 0.5 months (Mean \pm SEM). Patients in the corticosteroid group (n=66) attended more clinics (3.4 ± 0.1 vs. 2.2 ± 0.05 ; $p < 0.0001$) and were treated for longer (10.5 ± 0.6 vs. 5.5 ± 0.3 months; $p < 0.0001$) than patients in the surgery group (n=68). 62% (41/66) of patients treated by corticosteroid injection eventually required surgery, on average at 8 ± 0.7 months following their first presentation. In those who experienced temporary relief from corticosteroids, duration of efficacy was 4.5 ± 1.1 weeks. Monthly hospital income per patient was significantly lower for the corticosteroid than the surgery group ($\pounds 116.50 \pm \pounds 18.80$ vs. $\pounds 198.14 \pm \pounds 12.56$; $p = 0.0001$).

Conclusions: These findings are clinically and financially significant. Why patients with similar clinical and neurophysiological degrees of symptoms respond to local corticosteroid infiltration, whilst others do not, is still unclear. A prospective randomised controlled trial to identify these issues is currently underway.

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12:44 Preliminary results of extensive surgical intervention in carpal tunnel syndrome for patients with mucopolysacchirodoses

Miss R Aslam, Dr C Hendriksz, Miss R Lester, Mrs A Jester (Birmingham)

With increasing advances in treatment and management, we are seeing an increase in the survival of children with mucopolysaccharidoses. The treatments have had a limited effect on the debilitating musculoskeletal problems related to MPS. We regularly see delayed presentation of patients with significant functional problems related to nerve compression that show little improvement following conventional carpal tunnel release. There is little consensus on the correct surgical approach to decompression of the carpal tunnel in MPS patients, with a majority opting for standard release. It has been speculated in the literature that due to the deposits of GAG complexes, a more radical approach would be required to improve function.

We are presenting the preliminary results from our approach to carpal tunnel release in patients with mucopolysacchirodosis. We present a case series of MPS patients that have undergone standard carpal tunnel release unilaterally, followed by our more extensive approach on the other hand at a later date. Our approach involves an extended skin incision, microsurgical epineurotomy, release of guynon's canal and limited tenosynovectomy. A comparison is made with functional assessment, ADL questionnaires, and parental evaluation as outcome measures.

Our early results show clearly that there is improvement in function, with a reduction in stiffness and a significant observed difference noted in parent reports. Histological specimens we evaluated from our MPS patients, have shown GAG deposits within the epineurium and tenosynovium. The results are encouraging but raise the question of whether even more aggressive surgery could provide an even better outcome.

12:46 Second pathology in carpal tunnel syndrome

Mr J Pollock, Dr J Muzaffar, Dr A Hay-David, Mr S Southern (Wakefield)

Introduction: Recent changes in referral patterns have resulted in carpal tunnel syndrome (CTS) patients bypassing surgical outpatient appointments to direct surgical treatment after referral by the GP. In our experience a significant proportion of patients with CTS have additional hand pathology that requires treatment. Our study aimed to establish what proportion of patients referred for CTS to a specialist hand surgery unit were diagnosed with a second pathology, and compare this with patients seen in general clinics or fast-tracked to theatre.

Methods: We conducted a retrospective case note analysis of two hundred consecutive patients undergoing surgical carpal tunnel decompression in our trust. Notes were examined for details of the diagnosis and treatment of additional hand pathologies, along with their original referral route and demographics.

Results: After exclusions, one hundred and seventy-seven sets of notes were analysed, comprising 62 specialist clinic patients, 96 general clinic patients and 19 fast-track patients. 50% (31/62) of CTS patients seen through the hand service had a second diagnosis. This contrasts with patients seen in general clinics and fast-track patients, who had a 12.5% (12/96) and 0% second diagnosis rate respectively.

Conclusions: This study shows that a significant number of patients referred with CTS also have further hand pathology requiring intervention. This shows that the fast-track, production line treatment of CTS should be discouraged, as it fails to treat the patient holistically. Patients with CTS should be seen and assessed by a specialist hand service prior to any operative intervention.

12:48 Carpal tunnel decompression in patients over eighty

Mr I Roushdi, Mr J Gaskin, Mr C David (Worthing)

Introduction: Variable outcomes have been reported following carpal tunnel decompression (CTD) in the elderly (patients over 65). In our practice, we frequently encounter patients over eighty. The pressures of justifying 'low priority procedures' led us to prospectively evaluate outcomes in this previously under-reported group of patients.

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Method: Twenty consecutive patients over eighty having a carpal tunnel decompression had pre and post-operative scoring using the Boston carpal tunnel questionnaire at two weeks and three months post-operatively. Surgery was carried out in a standard open fashion under local anaesthetic and tourniquet.

Results: The mean pre-operative symptom score was 24.9 improving to 11.9 out of 44 post-operatively ($p=0.0002$). The mean functional score was 17.5 improving to 10.7 ($p=0.024$) out of 32. At two weeks, the patients were divided into 'responders', with an improvement of over two points in both elements of the questionnaire, and 'non-responders'. The 'responders' had a pre-operative mean symptom score of 26.6 improving to 7.1 post-op ($p<0.0001$). The mean functional score was 17.4 which improved to 6.4 ($p<0.0001$). The 'non-responders' had no significant response to surgery. 66% of the 'non-responders' did not have pre-op neurophysiology and one had a concomitant cervical stenosis. There was no significant difference in outcome related to pre-operative thenar wasting.

Discussion: Despite its status as a 'low priority procedure' CTD is a simple and effective intervention. This study demonstrates good results in the elderly even in the presence of thenar wasting, but we would advocate routine neurophysiologic assessment for this group.

12:50 Discussion

BELL SESSION

12:55 The anatomy of the subscapular nerves - A new nomenclature

Miss J Callear, Mr D Saleh, Professor S P J Kay (Leeds)

Aim: Previous study has delineated a variation in the posterior cord nerve branch anatomy. We sought to examine this variability and provide a nomenclature to aid surgeons.

Methods: Thirty-three preserved cadaveric upper limb and shoulder girdles were dissected. The origin of all nerves arising from the posterior cord (PC) and their target muscle were recorded.

Results: Additional nerves not classically described were commonly found on dissection. Upper subscapular accessory nerves (aUS) were present in 55% ($n=18$) and 11% of these ($n=2$) had two aUS nerves. Contiguous accessory lower subscapular nerves (aLS) were present in 9% ($n=3$). All upper subscapular nerves (USN) took origin from the PC. One aUS took origin from the thoracodorsal nerve (TD). ALS nerves were present in 30% ($n=10$) of specimens. These nerves solely innervated subscapularis. Of this group 50% ($n=5$) took origin from the PC, 30% ($n=3$) from TD, 20% ($n=2$) from lower subscapular nerve (LSN). Two aLS nerves were present in 3% ($n=1$). The LSN took origin from the axillary nerve (AN) in 15% of specimens and the TD in 3%. Interestingly none of the specimens where the LSN nerve did not have origin directly from the PC had associated aLS nerves.

Conclusion: We propose a new nomenclature for these common variations. The accessory upper subscapular nerves arise between the USN and TD. The accessory lower subscapular nerves arise distal to the TD and solely innervate subscapularis. Recognition of these accessory nerves may provide donor nerves or sites for selective denervation for plexus surgeons.

12:57 Quick onset long acting brachial plexus blocks in hand surgery

Mr A El Gawad, Mr M Saleh, Dr A Logan, Mr F Fahmy (Chester)

Purpose: Axillary brachial plexus blocks are our standard form of anaesthesia for hand surgery. This has largely replaced the need for a general anaesthetic. We hereby present our technique, describing a new formula of injection that permits a fast acting block without the need to wait as with the usual local anaesthetic used in most brachial plexus blocks.

Methods: A retrospective audit was done for the last six months. Thirty-six patients were included. Age: 25-67 years. The surgical procedures were Dupuytren's contracture, surgery for the arthritic hand, tendon surgery and bone surgery. Data was collected through a questionnaire, which included the time lapse from anaesthetics

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administration to the start of operation, patient satisfaction rate of the anaesthesia, and the need for post-operative pain control.

Results: Analysis of our data demonstrates minimal lapse time and high satisfaction rate.

Conclusions: This new formula offered an effective and rapid onset anaesthesia, as well as long lasting post-operative pain control. This enabled a high turnover of the list with minimal delays between cases, maintained post-operative pain relief and hence a quicker recovery. The patient satisfaction rate was high.

12:59 The prevalence of constitutional risk factors and occupational use of hand-held vibrating machinery in operated carpal tunnel syndrome

Mr B Gooding, Mr H Salem, Miss K Ramsay, Professor T R C Davis (Nottingham)

Introduction: Long-term use of hand-held vibrating machinery (HHVM) may be associated with carpal tunnel syndrome (CTS), but this association is controversial.

Methods: Constitutional risk factors for CTS and occupational use of HHVM was assessed in a prospective cohort of one hundred and ninety-seven patients undergoing carpal tunnel decompression surgery.

Results: The most common constitutional risk factors found were obesity (41%), diabetes (13%), previous wrist fracture (12%), rheumatoid arthritis (8%) and thyroxine medication (5%). Fifteen of the 24 men with a history of occupational use of HHVM also had at least one constitutional risk factor for CTS, compared with twenty-seven of the 52 with no history of occupational use of HHVM.

Conclusion: The prevalence of constitutional risk factors in these two groups is not significantly different ($p=0.39$) and our findings do not suggest a causal link between HHVM and CTS requiring surgery.

13:01 Upper limb hypoplasia in obstetrical brachial plexus palsy

Mr S Maciburko, Mr H P Giele (Oxford)

Introduction: Upper limb hypoplasia in OBPP is poorly documented. This study evaluates the relationship of limb hypoplasia with severity of plexus injury, primary nerve repair surgery, secondary shoulder surgery, degree of neurological recovery and growth.

Methods: We conducted a prospective longitudinal study of OBPP patients over a thirteen-year period (1997-2010). Patient details, including extent of plexus injury and any primary nerve repair or secondary shoulder surgery performed, were recorded. Detailed measurements of both upper limbs and examinations to assess neurological recovery were completed at each clinical visit.

Results: Our cohort consisted of sixty-one patients (56% female, age range 1-17). Affected limbs were hypoplastic by an average of 7.2%. Hypoplasia was proportional to severity of injury and extent of neurological outcome. There was no significant difference in the degree of hypoplasia between patients who had primary nerve repair surgery and those who did not. For the cohort as a whole, the degree of hypoplasia did not change with growth.

Conclusions: All OBPP patients in this cohort had an hypoplastic upper limb to some extent. Degree of hypoplasia was influenced by severity of injury and neurological outcome, but not primary nerve repair surgery or growth. This data will allow surgeons and therapists increased confidence to inform parents and children of their condition.

13:03 The biological nerve repair by means of the vascularised autologous epineurial transposition (a condition similar to "traumatic axonotmesis")

Dr A Messina (Turin)

This study aims to show our experience through a new technique in nerve repair. The procedure performs the condition similar to the well known traumatic axonotmesis lesion to ensure the best functional recovery of nerve lesion.

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Methods: We perform a partial direct fascicular repair of only three to 5 peripheral leading fascicles, combined with an autologous vascularised epineurial transposition of an injured nerve. Inside the section line, a central environment is constituted, in which neurotrophic growth factors can concentrate. Spontaneous outgrowth of Schwann cells and the extension of axons of the central unmatched fascicles (98% of the total), will occur in complete absence of central suture material (interfascicular scarring). The distal vascularised epineurial transposition increases the mechanical stability, relieves tension upon the fascicular sutures and shields axonal regrowth and fascicular suture from external scar tissue.

From 1994 to 2010, thirty-one lesions were evaluated. Excellent functional results were obtained in thirteen repairs (43.93 % of cases); good in 14 (45.16 %); fair in 1 (3.22 %) and poor in 2 cases (6.45 %). Overall excellent and good results were: 87.09 % with a follow-up of four years and 3 months (from 3 m. to 16 y).

Existing natural neurotropism for spontaneous axonal matching may be even more effective if a protective central environment and a condition similar to the anatomopathological traumatic axonotmesis lesion by means of the vascularised autologous epineurial transposition is performed, favouring a best functional recovery of the injured peripheral nerve.

13:05 **Discussion**

13:10 **Lunch and Trade Exhibitions**

SYMPOSIUM: NERVE REPAIR – THE FUTURE

Chairmen: Mr J S Watson/Professor T R C Davis

14:10	Neuroprotection	Professor A M Hart
14:30	Motor regeneration	Dr A Bishop
14:50	Neuropathic pain in peripheral nerve injury: Skinny evidence?	Dr E Walbeehm
15:10	Endoscopic nerve decompression	Dr R Hoffmann
15:20	Free muscle transfer	Dr A Bishop
15:40	Panel discussion	

16:10 **Refreshments and Trade Exhibitions**

DOUGLAS LAMB LECTURE

Chairman: Professor D A McGruther

16:40 **Evaluating the outcome of experimental nerve repair**
Professor T Brushart, Johns Hopkins Hospital (Baltimore)

A wide variety of anatomic, physiologic, and behavioural tests have been used to evaluate the outcome of experimental nerve repair. Although these tests clearly measure different aspects of regeneration, there is currently no unifying concept that defines their relative roles. This problem has been approached by organising experimental outcome measures in a framework modelled on that used for clinical studies. Measures are assigned to one of four levels, based on what they can reveal about regeneration. Category 4 studies indicate that regeneration has occurred, Category 3 that end organs have been reinnervated, Category 2 that regeneration has been specific and Category 1 that voluntary function has been restored. The measures classified in categories 3 and 4 interact to describe the function of neuromuscular or neurosensory units, either singly or in bundles, but with little reference to their central connectivity. The measures in categories 1 and 2, in contrast, describe the consequences of systems organisation. Great success in categories 3 and 4 may thus fail to predict voluntary function. An understanding of these relationships is critical to choosing outcome measures that provide relevant answers to specific experimental questions.

19:15 **Society Dinner**
Cruising down the Thames on the Symphony

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08:30 Registration

09:00 Annual General Meeting
(open to Members and Associates only)

DUPUYTREN'S SYMPOSIUM

Chairmen: Professor J J Dias/Mr L C Bainbridge

09:40 Dupuytren's disease genetics for dummies Professor P Werker
09:45 Update on Dupuytren's disease and Collagenase Professor L Hurst

FREE PAPER SESSION

Chairmen: Mr I A Trail/Mr A N M Fleming

10:25 Needle aponeurotomy at the Pulvertaft Hand Unit - Efficacy, safety and complications
Mr N Kain, Miss M O'Brien, Mr P Russell, Miss J Arrowsmith (Derby)

Background: Needle aponeurotomy (NA) is one of the emerging, though controversial, treatments for Dupuytren's disease. This minimally invasive treatment is used for contractures due to a palpable cord lying beneath redundant skin. In the UK, there are currently no reported studies on NA.

Methods: A prospective study was carried out at the Pulvertaft Hand Unit. Patients were treated over a three-year period. Measurements of total passive extensor deficit (TPED) in treated joints were taken at baseline, immediately following NA and follow-up at six weeks, six months and one year.

Results: One hundred and sixteen patients with 193 digits were treated with NA. The ring finger was most commonly treated (44%), followed by the little finger (42%). Average improvement of TPED from baseline after treatment was 35° (p<0.001). The benefit remained statistically significant up to one year. Complications included skin tears, nerve symptoms and two tendon ruptures. Recurrence rate after one year was 5.2% of patients / 3% of treated digits with:

1. 2.6% / 1.6% - repeat NA
2. 2.6% / 1.6% - open surgery

Discussion: This is the first study in the UK assessing the effectiveness of NA. Our results suggest that NA is effective (p<0.001) for a select group of patients with Dupuytren's disease. The two tendon ruptures show that there is a learning curve even with trained hand surgeons. The short duration and the ability to return to work one week post treatment appear to be significant factors in patients' willingness to undergo repeat NA.

10:33 Discussion

10:38 Outcomes of a specialist one-stop Dupuytren's percutaneous needle fasciotomy clinic
Mr J Foote, Mr L Dodd, Mrs J Oakley, Miss V Nunez (Frimley)

Introduction: Percutaneous needle fasciotomy (PNF) has an important place in the management of Dupuytren's disease. We have set up the first dedicated NHS one-stop clinic in England to perform this procedure.

Methods: We prospectively recruited sixty-one patients with Dupuytren's contractures to have PNF. Average age was sixty-five. There were eighty-one fingers operated on including 69 MCP joints, 62 PIP joints and 6 DIP joints. Average Tubiana score was 2 bilaterally. We recorded contractures, grip strength and DASH scores pre PNF as well as any complications. At follow-up, we recorded the patient global impression of change (PGIC), DASH score, degree of straightness and whether they would have the procedure again and recommend it.

Results: The average pre-treatment contracture was 43, 48, 41 degrees for the MCP, PIP and DIP joints respectively. The average post-treatment contracture was 3, 17, 20 degrees for the MCP, PIP and DIP joints respectively. Eight patients had small skin tears, 2 found it too uncomfortable to continue and there was one

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case of infection. We had a minimum six months follow-up (6-24 months). The average PGIC was 6 (very good) and the average DASH score was 30.9 (excellent). Average straightness was 2 (almost completely straight). All but four patients would have the procedure again and recommend it.

Conclusion: This specialist one stop Dupuytren's PNF clinic has so far proved very efficient and safe, and our patients are highly satisfied. It is also cost effective. We are continuing to collect data prospectively.

10:46 **Discussion**

10:51 **Medium term outcomes of two-stage Dupuytren's contracture correction: A prospective single surgeon consecutive case series of fifty-two patients between 2003-2009**

Mr S Chan, Mr N Gogi, Mr L Wicks, Mr S Deshmukh (Birmingham)

Objective: To assess the medium term functional and objective outcomes for two-stage Dupuytren's contracture correction.

Methods: Patients with severe contracture were offered a two-stage correction. This involved application of external fixator to distract the contracture over the course of two weeks and subsequent partial fasciectomy (in primary contractures) and dermofasciectomy plus full thickness skin graft (in recurrent contractures). A series of fifty-four corrections in 47 patients were identified. Of these, six were lost to follow-up, one deceased. Pre-operative total range of active movement (TRAM), total flexion contracture and PIP flexion contracture, Tubiana grade and DASH/Michigan Hand Scores were recorded and compared to post-operative data.

Results: Average age was sixty (range 43-90), 37 male, 10 females. The average duration of follow-up was thirty-two months (range 6-96). The average pre-op fixed flexion deformity (FFD) in the PIPJ was 84° (range 50-110, SD-12). The average post-op FFD in the PIPJ was 29 (-5-90, SD-26). The average pre-op TRAM was 70° (range 10-140) compared with a post-operative TRAM of 151° (range 30-235). Post-op DASH scores improved from 32.0 to 27.6. Complications include stiffness (7%), CRPS (7%), infection (4%), graft failure (4%), neurovascular injury (2%), fracture (2%).

Conclusions: Medium term follow-up of this two stage technique shows that the correction, range of movement and function is maintained. We consider that the complication rate is acceptable for these very severe deformities, where amputation, joint fusions and total collateral ligament and volar plate release are the only other comparable surgical alternatives.

10:59 **Discussion**

11:00 **Refreshments and Trade Exhibitions**

KEYNOTE LECTURES

Chairman: Professor D A McGruther

11:30 **Dupuytren's: What trials need to be done?**

Professor P Werker, University Medical Centre Groningen

11:50 **Allotransplantation**

Dr A Bishop, Mayo Clinic (Rochester)

HUNTERIAN LECTURE

Chairman: Professor D A McGruther

12:20 **Acute scaphoid waist fractures – Prediction of outcome with non-operative treatment**

Professor T R C Davis, Queen's Medical Centre (Nottingham)

Scaphoid fractures have a bad reputation and cause concern as some fail to unite, resulting in a non-union which may result in persistent pain and/or the development of painful post-traumatic osteoarthritis in future

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years. This concern and an inability to accurately predict which fractures will, or will not, unite has led some surgeons to advocate operative fixation of virtually all scaphoid fractures in the hope that this will reduce the risk of non-union. However, operative fixation of all scaphoid fractures appears illogical if it is agreed that approximately 85% of scaphoid fractures unite if treated non-operatively in a below elbow plaster cast.

This lecture summarises the findings of several studies which have investigated whether it is possible to accurately predict which scaphoid fractures will, and which will not, unite with non-operative treatment in a below elbow plaster cast.

The findings of these studies suggest that:

1. The outcome of an acute scaphoid fracture cannot be accurately predicted by assessment of fracture configuration, displacement or comminution on standard scaphoid series X-rays.
2. The vascularity of the proximal fracture fragment is not a major determinant of union/non-union.
3. Assessment of fracture displacement with good quality CT/MR scans can predict union/non-union and has demonstrated that:
 - a. the majority of undisplaced scaphoid fractures (as assessed with CT/MR) only require four weeks immobilisation in a below elbow plaster cast, rather than the standard 6 or 8 weeks.
 - b. scaphoid fractures with less than 2mm displacement (measured by CT) appear to reliably unite with non-operative treatment, whereas there is a high non-union rate for those with more displacement.

A further study of the effect of malunion (as measured on CT scans) on outcome demonstrated that the present measures of malunion have poor reproducibility and that the degree of "malunion" encountered with the majority of scaphoid fractures does not affect the clinical outcome at one year.

Most scaphoid fractures seen in a general Orthopaedic practice are undisplaced or have less than 2mm displacement, and thus non-operative treatment of the majority remains an acceptable option. However there is a strong argument for reduction and fixation of fractures with greater displacement.

13:00 Lunch and Trade Exhibitions

13:55 Presidential hand-over

14:00 Presentation by Poster Prize Winner

KEYNOTE LECTURE

Chairman: Professor D A McGrouther

14:05 Vascularised bone grafts to the upper extremity

Dr A Bishop, Mayo Clinic (Rochester)

FREE PAPER SESSION

Chairmen: Mr J L Hobby/Miss B Jemec

14:25 The shunt-restricted technique for improved survival and reliability of venous flaps in reconstruction of digital defects

Mr W Lam, Dr N Waughlock, Dr Y Lin, Professor F Wei (Taiwan)

Introduction: The arterialised-venous flap has been described as an alternative option for reconstructing digital defects where either local, regional or other arterialised free flap options are unavailable. Despite the advantages of quick, simple dissection to provide a thin and pliable flap with an almost negligible donor site, it remains unpopular due to high congestion and unpredictable survival rates, largely caused by unrestricted arterio-venous shunting. We explore the hypothesis that shunt-restriction decreases congestion rates and improves survival rates of venous flaps.

Methods: Twenty flaps (19 patients) were performed for digital defects secondary to trauma (n=12), contractures (n=7) and malignancy (n=1). An arteriovenous shunt was first established antegradely via a digital

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artery inflow and a dorsal vein outflow. Shunt restriction was achieved by strategic placement of hemoclips as according to the venous configurations: (1) communicating branch of parallel veins in 'H'-flaps; (2) bifurcation point of a 'Y'-flap; or (3) midpoint of a single vein ('T'-flap). Average flap size was 9cm².

Results: All of the flaps survived. One flap developed epidermolysis with no eventual full-thickness loss. No evidence of venous congestion was found in 60% of the flaps post-operatively, while the remaining 40% demonstrated an initial congestion which always resolved within a week without any intervention.

Conclusions: This study confirms our hypothesis that shunt-restriction improves the survival of venous flaps with resultant increased peripheral perfusion and reduced congestion. The improved reliability may establish venous flaps as a potentially valuable option for reconstructing difficult digital defects with improved functional and cosmetic outcomes while decreasing donor morbidity.

14:33 **Discussion**

BELL SESSION

14:38 **Dupuytren's disease in patients infected with HIV - Is there an emerging pattern?**

Dr Z Jessop, Dr M Nelson, Ms B De Souza (London)

Background: The increased prevalence of Dupuytren's disease in HIV patients may be an important marker of disturbed metabolism of free radicals. The aim of this study was to evaluate the development of Dupuytren's disease in patients infected with HIV.

Methods: A retrospective study of patients with HIV infection referred for Dupuytren's disease was carried out. Data analysed consisted of date of diagnosis of Dupuytren's disease and the features of the disease and all known associated factors. The HIV antibody detection, CD4 count, viral load and antiretroviral medication was also recorded.

Results: Eleven male patients (age range 43-76yrs) infected with HIV were identified. Dupuytren's disease developed on average fourteen years (range 3-21), after detection of HIV antibodies. The mean CD4 count was 604 (range 252-1521), viral loads were undetectable (<50). Six patients developed recurrence after fasciectomy. The rate of recurrence was independent of CD4 count.

Conclusions: There is a paucity of literature with regard to HIV and Dupuytren's disease as an association and published prevalence study results are conflicting. Our results from a limited series shows that Dupuytren's disease is related to longstanding HIV disease and is progressive and possibly independent of antiretroviral medication.

14:40 **The Foucher's 'Kite-Flap'**

Dr Z Bellaaj, Dr Z Ellouz, Dr M Trigui, Dr F Gdoura, Dr M Zribi,
Professor K Ayadi, Professor H Kiskis (Tunisia)

Introduction: The "kite-flap" or Foucher's flap is a cutaneous island flap, based on the neurovascular structures of the first dorsal metacarpal artery flap and radial nerve-sensitive branches. The "kite-flap" is the solution of choice for the extended loss of substances of the thumb. We report our experience using the "kite-flap" to demonstrate the advantages, disadvantages and the place of this flap for coverage of skin loss on the thumb on the dorsal and on the palmar side.

Materials and Methods: Our study evaluates twelve "kite-flaps" performed in our institute. The skin defects were on the dorsum aspect of the thumb in eight cases, on the palmar aspect in 3 cases and on the pulpar aspect of the thumb in one case.

Results: The immediate evolution has been characterised by the occurrence of two cases of transient suffering, a superficial necrosis without affecting the final functional outcome. The results of our series are very good after an average of two years follow-up and all patients use their thumb in daily activity. We have, however, had four cases of cold intolerance and one case of shrinkage of the first commissure.

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Conclusion: It appears that the “kite-flap” is the best solution for cover of simple or complex skin loss of the thumb. On the dorsal aspect, according to literature, it is superior to other local and distance flaps. On the palmar aspect, it is a good alternative, comparable to other local solutions and it provides good results. Its technical performance is easy and it gives durable, sensate and stable skin cover.

14:42 Arterialised "unreversed" free venous flap for the reconstruction of the hand

Mr T Giesen, Dr W Künzi, Professor P Giovanoli, Dr M Calcagni (Zurich)

Arterialised free venous flaps with “unreversed” parallel veins have been already proven to be a safe procedure for complex defects of the hand. The authors performed six arterialised venous free flaps, having at least two parallel unreversed veins for the reconstruction of hand large or complex tissue defects. The mean area of coverage was 39cm². The donor sites included the volar aspect of the proximal forearm in three cases, the middle forearm in two cases and the thenar area in one case. The donor site was always closed primarily. Two flaps were composite flaps, including a superficial cutaneous nerve of the forearm. One flap was a flow-through flap on the ulnar artery at wrist level. All flaps survived. Congestion was seen in one case. No revision was needed. The authors had satisfactory results, using arterialised “unreverse” venous free flaps, having at least two parallel veins. All flaps were highly customised with regard to dimension, quality of skin, pedicle length, vessels size, inclusion of extra anatomical structures other than skin and fat, donor site.

14:44 Squamous cell carcinoma on the hand and wrist: A seven-year review

Mr M Singh, Mr Z Shariff, Mr J Rodrigues, Dr A Wright, Mr S Al-Ghazal (Bradford)

Introduction: Squamous cell carcinoma (SCC) is the second most common cutaneous malignancy, and its incidence is increasing. Our aim was to assess the incidence, pathological grade, prognosis and recurrence of these lesions on the hand and wrist.

Methods: We retrospectively reviewed all recent SCCs managed between 2003 and 2010 within a single UK plastic surgery/dermatology service.

Results: Eighty SCCs were identified in 79 patients on the hand and wrist, representing 10% of all SCCs. Mean age was seventy-seven years with a range of 40 to 97. The majority (38.8%) presented in the 80-90 age group, however 5% occurred in the lowest (40-50) age group. 13.8% were poorly differentiated, 33.8% moderately, 46.3% well and 6.3% had in situ disease histologically. There were five recurrences in total (6.3%), three local and two distant. Recurrence was higher with a poorly differentiated lesion (9.1%), compared with 3.7% for moderately, 2.7% for well and 0% for in situ disease. The time to recurrence ranged from 2.8 to 54.8 months, with 80% occurring within two years and 100% within 5 years.

Conclusion: Our results suggest up to 10% of SCCs may have their primary presentation on the hand or wrist, with up to 5% of these occurring between 40 and 50 years old. Recurrence was 6.3% overall, with 80% of these occurring within two years and 100% within 5 years. We therefore suggest a high level of suspicion be maintained for these lesions and follow-up for high risk lesions may need to extend up to five years.

14:46 A prospective pilot study to evaluate the use of Primatrix™ in full thickness skin defects of the hand as an alternative to local flap or skin graft

Mr C Smith, Mr J Ahmed, Miss A Toeman, Mr M James (London)

Introduction and Aims: Good outcomes have been reported using dermal substitutes following skin loss. This pilot study was designed to evaluate the use of Primatrix™ (TEI Biosciences, Boston, MA), an acellular dermal matrix derived from foetal bovine tissue, as definitive treatment for full thickness skin loss of the hand or digits without skin grafting.

Materials and Methods: Fifteen patients participated in the study. Full thickness skin loss of more than 1cm², which was not suitable for primary closure was treated. Fenestrated Primatrix™ was sutured directly over the wound in single or double layers, and dressed following an agreed protocol. Fourteen patients attended follow-up in a dedicated hand trauma clinic. Functional recovery was measured by the upper limb functional index. Aesthetic results were subjectively measured with a patient satisfaction survey.

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Results: Wound sizes ranged from 1.5cm² to 10cm². The majority of soft tissue defects were over the volar or lateral surface digits. All soft tissue defects exhibited progressive assimilation of the Primatrix™ into the wound with no incidence of rejection. Full wound healing occurred by the 6th-7th week without the need for any form of skin graft. Fingerprints regenerated by the twelfth week. No functional restrictions were reported. Patients indicated they were either satisfied or very satisfied with the aesthetic results. Early results show varying degrees of sensory recovery.

Conclusions:

- Primatrix™ provides excellent aesthetic and functional results without skin grafting.
- Using double layers of Primatrix™ can improve filling and contouring.
- Sensory recovery warrants further investigation.

14:48 **Discussion**

14:53 **'Preventing the Paintbrush' - A novel tendon retrieval technique**

Mr A Molajo, Mr A Mishra, Mr D Bell (Liverpool)

Introduction: Retrieval of retracted flexor tendons during surgery can be time consuming and may result in further trauma to the tendon. Retrieval methods have been described. We report our experiences with a new method.

Method: The retracted tendon is located and, using a non-absorbable mono-filament suture, a transverse pass is made through the tendon, a locked loop is formed from each end and positioned as close as possible to the cut tendon end. The needle is removed and whilst maintaining tension the suture ends can be passed under the pulleys. With gentle traction, the tendon can be delivered. Using this suture to hold the tendon end, a core suture can be inserted without the need to grip the end of the tendon with forceps.

Results: We have found this technique speeds up tendon retrieval and delivery through the pulleys, preventing 'paint-brushing' and facilitating tendon repair with minimal trauma to the tendon. We have also used this technique on both pig trotter tendon and silicone tendon models for teaching purposes.

Conclusion: This technique enables easy retrieval of a retracted flexor tendon with minimal trauma to the cut tendon end. This technique allows the surgeon to hold and control the tendon to facilitate repair without the use of forceps which may cause further injury to the tendon. This technique is easy to reproduce in vivo and vitro.

14:58 **Discussion**

15:01 **Evaluation of functional results of pronator teres muscle transfer to both radial and ulnar wrist extensors to improve hand grip strength in tendon transfer for radial nerve palsy**

Associate Professor M Quolquela (Egypt)

Introduction: In making a fist, ulnar deviation of the wrist is concomitant with its dorsiflexion. Pronator teres (PT) transfer to extensor carpi radialis brevis (ECRB) only results in some radial deviation. PT tendon transfer to both ECRB and extensor carpi ulnaris (ECU) tendons was suggested to induce ulnar deviation on making a fist.

Material and Methods: We had two patient groups with radial nerve palsy complicating humeral shaft fracture. The first group (12 patients) had PT transfer to ECRB and ECU tendons. The second group (13 patients) had PT transfer to ECRB only. In all, middle and ring flexor digitorum superficialis (FDS) tendons were transferred to finger and thumb extensors. Through an approach along the radial border of the forearm, the PT tendon was sutured to extensor carpi radialis longus (ECRL) and ECRB tendons. The ECRL tendon was divided at its insertion and sutured to the ECU tendon so that PT pulls on both ECRB and ECU. The wrist was immobilised in a volar splint in 45° dorsiflexion and ulnar deviation for six weeks.

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Results: Average follow-up was twenty-nine months. Post-operative average hand grip was 81% of the normal side in the first group compared to 61% in the second group. On making a fist, average ulnar deviation was 18° in the first group compared to 2° radial deviation in the second group. 76% of patients in the first group had grade 4 wrist extensor power compared to 83% of the second group patients having grade 3.

Conclusions: PT tendon transfer to ECRB and ECU improves ulnar deviation with increase of gripping strength.

15:06 Discussion

15:09 In-vivo healing of flexor tendon repairs utilising high resolution ultrasound imaging

Dr J Watson, Dr W Bhatti, Mr P Malone, Professor D A McGrouther (Manchester)

Ultrasound scans of tendon repairs is an excellent method for the pre-operative assessment of tendon tears and the evaluation of post-operative complications. This project aims to provide an insight into in-vivo tendon healing by serial ultrasound assessment and to determine the value of such scans as an adjunct to rehabilitation.

Ten patients with zone I and II flexor tendon repairs were recruited prior to rehabilitation. The flexor tendon repairs were imaged, using ultrasound at multiple time points over the first ten post-operative weeks, using the Siemens Acuson S2000 and an 14MHz probe. The images and videos were compared between time points and contrasted to their contralateral 'normal' digits.

Pathological changes were seen in symptomatic and asymptomatic patients, from day three post-operatively. Ultrasound findings included adhesions, 'bowstringing' and 'iatrogenic triggering'. Through serial scans the development of adhesions was witnessed, as was the reorganisation of tendons and their surrounding tissues. The visualisation of the tendon repair site was often obscured during the initial six weeks, secondary to acoustic shadowing.

Herein, the ultrasonic appearance of the evolution of flexor tendon healing has been captured. Serial scans at early time points were shown to be safe and revealed pathology, however certain sonographic views were clouded by a hypo-echoic region. We suggest ultrasound scans:

- Early after tendon repair if rehabilitation is not progressing well, to guide intervention.
- At a fixed time point, to evaluate the status of the healing tendon for patient counseling, surgical feedback and tailoring rehabilitation.

15:14 Discussion

15:17 Results of silastic arthroplasty for severe proximal interphalangeal joint degenerative disease

Miss L Astle, Mr V Voon, Mr A Chojnowski (Norwich)

The aim of this study is to assess outcome of proximal interphalangeal joint (PIPJ) arthroplasty with silastic (Osteotec) implants.

Twenty-nine implants were performed on 24 patients - 20 for primary osteoarthritis, 8 for inflammatory arthritis and 1 for trauma. Follow-up ranges from four to 55 months (mean 23 months). Silastic arthroplasty was offered to those who declined arthrodesis and were not suitable for anatomic surface replacement implants due to severe joint destruction.

A prospective hand therapy database provided results, showing Quick DASH (Disability of Arm Shoulder and Hand) scores improved from 43 to 28 out of 100 (0= no disability). Arc of movement was maintained at 38° mean (range 1°-80°) pre-operatively and 38° mean (range 12-57°) post-operatively. Of the six index finger PIPJ's replaced, pinch grip was maintained or improved.

Good patient satisfaction and pain relief was found over this follow-up period. There was one complication of stitch abscess treated successfully.

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This study supports the use of silastic implants in severe PIPJ arthropathy, including that of the index finger, where patients look toward operative intervention for pain relief and have declined arthrodesis.

15:22 Discussion

15:25 Treatment of complex fracture subluxations of the proximal inter-phalangeal joint using a ligamentotaxis device: A multidisciplinary approach

Mr R MacFarlane, Ms S Gillespie, Ms F Cashin, Mr A Mahmood, Mr D Brown (Liverpool)

Introduction: Fractures at the proximal interphalangeal joint of the finger are common and unpredictable in their outcome. A range of external fixation devices have been used, including the recently introduced Ligamentotaxor (JB Implants, Rosmalen, Netherlands). We present clinical results of treatment of fractures at the PIPJ with the Ligamentotaxor device and an intensive multidisciplinary rehabilitation regime.

Methods: Thirty patients in a three-year period underwent closed reduction and external fixation with the Ligamentotaxor. Patients underwent a standardised rehabilitation regime post-operatively. The device was placed for six weeks, with radiographs and clinical review every two weeks until union. A multidisciplinary team, including a hand physiotherapist and occupational therapist, reviewed the patients weekly.

Results: Twenty-one male and 9 female patients were studied. Male to female ratio 2.33:1. Ring finger injuries were most common (16/30). According to Seno's classification, there were two patients with type 1a injuries, 6 patients type 1b, 8 patients type 1c, 3 patients type 2b, 2 patients type 2c, 4 patients type 3 and 3 patients type 5. Mean time to surgery was 7.76 days (range 1-18). Final mean range of flexion at the PIPJ was 86.3° (range 65°-110°) and mean final QuickDASH was 1.9 (range 0-22.7). Mean length of follow-up was 10.4 weeks (range 5-26).

Discussion: The Ligamentotaxor is a safe and valuable device for the treatment of these injuries. A high proportion of our patients progressed to excellent functionality, attributable to the device controlling reduction, whilst allowing full movement, facilitating an early multidisciplinary approach to rehabilitation with a strict and regular protocol.

15:30 Discussion

BELL SESSION

15:33 The use of high resolution ultrasonography in assessment of nail related disorders

Mr R Singh, Dr D Bryson, Mr H Singh, Dr J Kanagaratnam, Professor J J Dias (Leicester)

Aim: Disorders of the nail can pose a diagnostic challenge and non-invasive imaging is frequently required to clarify diagnosis. We report the use of high-resolution ultrasonography in the assessment of patients with nail disorders.

Methods: A search of a university teaching hospital musculoskeletal radiology database identified thirty-six patients (mean age 54.2 years) where ultrasonography was used to assess nail related disorders. Clinical, surgical and histological findings were correlated with ultrasound reports.

Results: Ultrasound confirmed the diagnosis in twenty (61%) of 33 patients and provided a diagnosis in 3 patients where a provisional diagnosis was unavailable. In seven of the 13 patients where the clinical diagnosis differed from ultrasound findings, cystic lumps were found to be solid on ultrasound. Of the ten available histology results, 6 correlated with the findings of ultrasound assessment but two were granulomas rather than the suspected glomus tumour, and two were benign cysts instead of a suspected giant cell tumour of the tendon sheath. Ultrasonography provided additional information which could not be obtained by clinical examination alone. This included the vascularity, nature (solid/cystic), margins of lump; changes in nail structure and extension of lump into the nail bed, matrix, fold or underlying bone.

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Conclusion: Ultrasound is a useful tool in assessing nail related disorders and can help in pre-operative planning, as it provides important information on the anatomy in thirty-one (86%) of the 36 patients presenting with nail related disorders.

15:35 Comparative evaluation of grip and pinch strength in Asian and European population

Mr S N Anjum, Mr P Choudary, Mr R Dimri, Mr S Ankarath (Huddersfield)

Introduction: Evaluation of grip and pinch strengths (GPS) of the hand is an effective way of measuring the hand function. There is no study available on grip strength in young healthy Asian populations. This study was done to find out the GPS in adult Asians and to compare the results with that in Europeans.

Methods: A Jamar dynamometer (Asimow Engineering®) and Pinch Gauge (B & L Engineering®) were used for measuring grip and pinch strengths respectively in pounds. The American Society of Hand Therapists' recommendations for standard hand positioning for the tests were followed. Subjects were healthy adults divided into five age groups of ten-year intervals. The height and weight of all subjects was also recorded.

Results: There were one hundred and five Asians and 103 Europeans. The mean grip strength in Asians was 92.8 (right) and 89.3 (left) in males and 53 (right) and 51.3 (left) in females respectively. The key pinch strength and tip pinch strength were 22 and 15.3 in males and 15 and 10.3 in females respectively. The grip strength was noted to be higher in Europeans than in Asians. However, the pinch strength was higher only in European females and not in both sexes. Grip strength has a direct relationship with height and weight but not with body mass index.

Conclusions: This study shows that the normal values for grip and pinch strengths are lower for Asian as compared to European groups. The published data for Europeans should not be used as the reference standard for Asian populations.

15:37 Ignore the cyst - A case series on osteophyte excision as the sole treatment modality for mucinous cysts

Miss P McGee, Mr S Dustagheer, Mr K Herbert (Belfast)

Introduction: Digital mucous cysts are benign ganglia that arise on the dorsal aspect of the digits between the distal interphalangeal joint and the proximal nail bed. The cysts may be asymptomatic or they may present with pain, nail deformity or leakage of cyst contents. Treatment of the condition remains controversial. We present a single surgeon's experience, consisting of osteophyte excision through a skin incision alone.

Methods: Patients were identified retrospectively and their case notes and radiographs reviewed. The surgical procedure involved excision of osteophyte and primary closure. Three different incisions were used. The mucous cyst left in situ. Data was collected and analysed on the pre-operative symptoms, surgical technique, post-operative outcome, splintage and complications.

Results: Twenty-nine patients were identified and procedures were carried out on 34 digits under local anaesthesia. Surgical technique was by means of a mid-lateral incision in 52.9%, "C" shaped in 32.3% and a transverse incision in 14.7% of digits. Osteophytes were excised in all thirty-four digits and the wound closed directly. Improvement in the appearance of the mucous cyst was achieved in all thirty-four digits. Complications included extensor lag in 8.8%, stiffness in 5.8% and wound infection in 2.9%. A single case of wound infection with subsequent osteomyelitis was noted (2.9%).

Conclusion: Excision of osteophyte alone and direct closure is an effective means of treating digital mucous cysts and results in high success rates.

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15:39 A new method of stabilisation of the MCP joint of the thumb

Dr L Cooper, Mr D Sammut (Bristol)

Hyperextension instability of the MCP joint of the thumb is a frequent accompaniment of osteoarthritic change at the CMC joint. The metacarpal base slides in a radial direction, with collapse of the 1st web space, and the MCP joint goes into reciprocal hyperextension to form the classical Z deformity. Similarly, in intrinsic muscle paralysis, the loss of the stabilising contribution of the thenar musculature and of adductor pollicis permits hyperextension of the MCP joint.

In both of these situations, thumb performance is impaired. The options for management of this situation include:

1. temporary stabilisation in some flexion, with a transarticular K wire;
2. fusion of the MCP joint; or
3. various forms of tenodesis

Each method is designed to tighten the palmar elements and prevent hyperextension.

We present a simple and reliable method of tenodesis. If this is performed in combination with trapeziectomy, the technique uses a strip of extensor pollicis longus. In cases combined with opponensplasty, the procedure utilises the redundant end of the transferred tendon. Each can be anchored into a pulley fashioned from the sheath of the flexor pollicis longus.

The procedure is described in detail and a number of cases are presented.

15:41 Reconstruction of the radial collateral ligament of the metacarpophalangeal joint of the fingers

Mr J Dickson, Mr D Evans (Windsor)

Introduction: A chronic painful injury to the radial collateral ligament of the metacarpophalangeal joint (MCPJ) of the finger can have a significant impact on function. The radial collateral ligament of the index finger is easily accessible and can be repaired directly. Rupture to radial collateral ligament of the little finger MCPJ results in a persistently abducted finger, which can be corrected by performing a tendon transfer. For the middle and ring fingers, access to the ligament is more limited. In addition, the assemblage nucleus is an important anatomical structure which is suspended by the collateral ligament and plays a key functional role in these fingers. If the collateral ligament is ruptured, the assemblage nucleus will drop, with significant functional consequences. We describe a method of ligamentous reconstruction which can be used for the middle and ring fingers to both stabilise the joint and relocate the assemblage nucleus.

Methods and Results: Ten patients are presented, of whom eight were treated with the described reconstructive technique, one was treated by re-attaching the ligament using a suture and one was treated using a tendon transfer. All patients had a good result (based on Quick DASH outcome scores) and were able to return to work.

Conclusions: The specific technique used to reconstruct the collateral ligament of the MCPJ should be tailored to suit the finger that is affected. We highlight the importance and significance of the assemblage nucleus in the pathology of these injuries and present a reconstructive technique which respects this key structure.

15:43 Discussion

15:48 Digital mucous cysts - Results of sixty-nine patients following surgical excision using a local rotation skin flap

Mr S Johnson, Mr Q Cox (Inverness)

Introduction: Digital mucous cysts (DMCs) arise from the distal inter-phalangeal joints of the digits. They often rupture spontaneously and nail deformities are common. Although surgical excision is recognised as the most successful treatment, there is no clear consensus as to the most appropriate operative technique.

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Methods: A retrospective review identified all patients who underwent excision of a mucous cyst using a local rotation skin flap by the senior author in a ten-year period. Patients were all seen pre-operatively and at a minimum of six months post-operatively.

Results: Sixty-nine patients were included in the study and were reviewed at an average of 37.7 months post-operatively. No patients were lost to follow-up. There was one cyst recurrence (1.4%). Sixty-seven (97.1%) patients were happy with the scar and sixty-three patients (91.3%) said they would have the procedure performed again. Sixty-six patients (95.7%) were content with their post-operative range of movement, which was on average 8.1° less than pre-operative values. Thirty-six patients had a nail deformity pre-operatively and twenty-one reported that the deformity grew out following the procedure. Only one patient (3.0%) developed a new deformity post-operatively. Five patients reported infection post-operatively with four prescribed oral antibiotics, but all resolved following one week of treatment.

Conclusion: This study, which is one of the largest analyses of an operative treatment for DMCs, demonstrates that cyst excision with a local rotation skin flap is a safe and effective technique with a low recurrence rate and high patient satisfaction.

15:53 Discussion

15:56 “Good surgical practice”: An audit of adult self-harm injuries to the upper limb and the 2007 NICE guidelines

Ms A Carbone, Dr M George, Mr D Chester (Birmingham)

Self-harm is a common presentation to the hand surgeon. The UK has one of the highest incidences in Europe with cutting the most common method of self-injury. The 2007 NICE guidelines provide guidance for the first twenty-four hours of presentation but surgical management is vague, “follow good surgical practice.” We look at the psychiatric input and surgical pathway and propose a course of management hand surgeons can follow for this distinct patient group.

Methods: A retrospective case note analysis of self-harm injuries presenting to the Birmingham Hand Centre from 2005-2010. Demographic data, psychiatric input and surgical management was documented.

Results: One hundred and fifteen patient episodes were identified from 81 patients. 60% of cases were referred to psychiatry, 55% were seen within 24 hours by the psychiatric liaison nurse. Only twenty-nine patient episodes were offered further follow-up. Of the fourteen patients who repeatedly self-harmed only 4 were offered formalised psychiatric follow-up. One hundred patients required surgery.

Injury	Volar Fingers (thumb)	Dorsum Fingers (thumb)
Zone 1	1 (1)	5 (1)
Zone 2	9 (1)	0 (1)
Zone 3	1	9 (3)
Zone 4	85	11
Zone 5	20	34
Zone 6	-	7
Zone 7	-	4
Ante-Cubital Fossa	6	
Fracture	2	
Dislocation	1	
Amputation	1	

Skin grafts, K-wires and cross finger flap techniques all failed due to infection and non-adherence.

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Conclusion: Psychiatric input should be initiated at presentation to the ED. As this patient cohort can be non-compliant with follow-up regimens, we propose that “good surgical practice” should be simple with repair of damaged structures, avoiding flaps and K-wires when possible. In patients with multiple episodes of self-harm requesting a consultant psychiatrist opinion may be more appropriate.

16:01 Discussion

16:05 The Open sky technique of exposure of the flexor canal

Mr D Sammut, Mr D M Evans (Windsor)

Flexor tendon surgery is technically demanding and the outcome depends on multiple factors, including integrity of repair, smooth gliding surfaces, atraumatic technique, expert rehabilitation and preservation of anatomical structures with vital biomechanical function, including the pulley system.

Maintenance of integrity of the pulleys is accepted as an essential element of technique. This poses problems of exposure and difficult access. The many described methods of tendon retrieval and manoeuvres beneath intact pulleys, during tenorrhaphy or tenolysis, as well as the debate on the venting of pulleys, testify to the difficulties posed by the cardinal principle of pulley integrity.

We present a new method of exposure of the flexor canal by incision and reflection of the pulley and simple, reliable, reconstruction which resolves this technical difficulty. The entire flexor canal can be visualised and the technique affords far less traumatic surgery, whether this be repair, tenolysis, tendon graft or re-insertion. Some aspects of flexor surgery, which would otherwise be impossible, are rendered possible. The method also has application in the exposure of difficult fractures.

The rehabilitative programme requires no modification. The operative technique is described and demonstrated in detail. A small clinical series is presented.

16:10 Discussion

16:13 Debates and Voting: How can we raise the status of hand research in the UK

Chairman: Professor F D Burke

- More trials (Professor T R C Davis) v. RCT's are impractical in surgery (Professor P McArthur)
- Experimentation (Professor J Nanchahal) v. Clinical trials (Professor J J Dias)
- Publish or perish (Mr H P Giele) v. Too many papers and presentations (Mr R Eckersley)
- BSSH meetings should have consultant papers (Mr J L Hobby) v. Meetings are for registrar papers (Mr S Rimouche)

17:00 Close of meeting

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1 Improving accuracy of coding for hand procedures following introduction of a local plastic surgery handbook for theatre staff

Miss C Tsang, Mr M Rance, Miss B Jemec (London)

Introduction: Medical coding is a fundamental step in the process of determining financial remuneration of clinical services. A locally devised surgery handbook was introduced in a single plastic surgery unit in 2007, as a measure to improve the accuracy of coding through clarification of surgical procedures to theatre staff involved in coding. The aim of this second audit is to assess the impact this intervention had on the accuracy of coding.

Methods: The study was conducted over a two-week period in December 2009. Medical notes were reviewed jointly with a senior clinical coder. Accuracy of diagnoses, procedural and Healthcare Resource Group (HRG) codes assigned were assessed.

Results: Fifty-two cases were reviewed. 38.5% of cases received incorrect diagnoses or procedural codes in the first audit in 2007. Following our intervention, there was an improvement to 36% in 2009, amounting to a 5% reduction rate in coding inaccuracy. In 2009, inaccurate coding resulted in a financial miscalculation of £9,183 over a two-week period. Examples included a case of digital fasciectomy (HRG - major hand procedure for non-trauma) miscoded as palmar fasciectomy (intermediate hand procedure) resulting in a loss of £2,362. Failure to include positive microbiology results, such as staphylococcus aureus, also led to an incorrect HRG tariff relating to co-morbidities and complications, amounting to a loss of £1,918.

Conclusions: This audit highlights the importance of correct clinical coding and the relevance of reducing such errors within the current financial climate under which the National Health Service functions.

2 Hand fracture assessment audit

Mr H Patel, Ms E Katsarma (London)

Introduction: Hand fractures are often managed in specialist hand units. The referral is often made by emergency department personnel via telephone to the receiving unit. Based on the information gained through the assessment and referral process a decision is made on management and follow-up. Due to the busy nature of emergency departments and constant thoroughfare of junior doctors, assessment and written documentation may be missing important information. An audit of the content of metacarpal fracture referrals to a busy hand unit was performed. The aim of this audit was to analyse referrals and devise strategies to improve the assessment and documentation of hand fractures.

Methods: No 'gold standard' exists for assessment and documentation of hand fractures. Specific and measurable standards were set and data collection commenced retrospectively. A total of sixty-six cases over a four month period were analysed. The documentation of the following key areas was recorded: patient details, history, clinical assessment, radiological assessment and management.

Results: The most important measurable standards are shown as a percentage: hand dominance (57%), side of injury (81%), deformity (32%), range of motion (41%), rotation (22%), fracture description (30%).

Conclusions: The inadequate assessment and documentation of hand fractures can have a significant impact on the patients' management and outcome as well as medico-legal consequences. A proforma of hand fractures was designed and piloted in the referring region to see if it improves assessment and documentation of hand fractures. A re-audit will be undertaken to determine its success.

3 Cadaveric dissections and radiographic findings regarding thumb carpo-metacarpal joint osteophytes and wear

Mr R Ray, Mr A Singh, Miss C Roslee, Mr M Pimple, Mr J Compson (London)

Introduction: Limitation of deep surgical exposure due to partial excision of the trapezium may lead to inability to visualise deeper osteophytes in the region of the beak ligament. We hypothesised that pre-operative radiographs may not give adequate information on the extent of wear and osteophytes, making CT scans necessary.

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Methods: We performed forty-five cadaveric thumb base radiographs on 15 thumbs followed by dissection of the thumb carpo-metacarpal joint to correlate the location of osteophytes and wear within the joint. On dissection of the cadaveric thumbs by clinicians other than those involved in the radiographic phase of the study, the depth and pattern of wear on both the metacarpal and trapezial articular surfaces was observed. An accurate and reproducible assessment of osteophyte location and size was then made for all dissections.

Results: The initial analysis of the thumb carpo-metacarpal joint radiographs showed good views of the osteophytes, with their location being variable. The beak ligament on the volar aspect of the joint was thought to be the main focus of the osteophytes radiologically. It was found that there was correlation between the location of the osteophytes clinically and radiologically. Wear patterns are difficult to visualise radiographically and showed little correlation with dissection findings.

Conclusion: Successful surgery involves removal of all osteophytes to reduce pain and therefore re-operation rates. We suggest that a series of correctly taken radiographs do correlate with dissection findings for osteophyte location, aiding the surgical approach to ensure total osteophyte clearance.

4 **Periosteal hand chondromas: A systematic literature review**

Mr D Nikkhah, Dr C Price, Dr S Carter, Dr M Solomons (Capetown)

Introduction: Periosteal chondroma is a rare slow growing benign neoplasm, accounting for less than 2% of chondromas. We describe an unusual presentation of this tumour in the hand, which has a scarcity of documented literature. We also discuss a series of learning points in the management of bone tumours in the hand and briefly review the published literature.

Methods: MEDLINE was searched for the terms 'Periosteal Chondroma' and 'Hand'. Seventeen relevant articles were identified. Of these, only two authors reported surgery because of finger dysfunction.^{1,2} Out of two hundred and twenty-eight documented cases of periosteal chondroma, 65 were located in the finger phalanges.²

Case report: A thirty-two year-old African lady presented with a painful, rapidly enlarging, firm mass over her left little finger over a period of six months. X-ray demonstrated periosteal reaction in the middle phalanx with scalloping of the bone. She was taken to theatre for marginal excision of tumour. Histopathology revealed a benign hyaline cartilage tumour arranged in a lobular pattern.

Conclusions: The surgical treatment of choice is marginal excision in periosteal chondroma, as incomplete excision may result in local recurrence. The surgeon should also note that rare tumours such as chondrosarcoma may simulate periosteal chondroma. Care should therefore be taken on clinical assessment to prevent overdiagnosis and unjustified radical surgical therapy.

References:

1. Yamauchi T *et al.* Solitary periosteal chondroma presenting as a snapping finger; an unusual location. *Hand Surg* 2008; **13**: 51–54.
2. Yoshimura Y *et al.* Multifocal Periosteal Chondromas. *J Hand Surg Am* 2011; **36**: 101–105.

5 **Management of multiple trigger digits: Injection or surgery?**

Dr P Nesbitt, Mr W Jamil, Mr P Jesudason, Mr L Muir (Salford)

Trigger finger is one of the most common problems presenting to hand clinics in the UK. Traumatic and compressive forces created through digital movement lead to thickening of the flexor tendon sheath. The most successful methods used to treat trigger finger are corticosteroid injection and surgical release. The ring, thumb and middle finger are the most frequently affected digits. The incidence of multiple digits being affected in non-diabetic patients is between 20% and 24%, with a higher incidence in Diabetes Mellitus sufferers. We report a case of failed injection therapy in a patient with multiple trigger digits, review the literature and advocate the use of surgical release as a first line treatment option in those patients with multiply involved digits.

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6 An atypical presentation of pisotriquetral osteoarthritis, subsequent flexor tendon rupture and a review of the literature

Mr B Dean, Mr G Becker, Mr C Little (Oxford)

Introduction: The attritional rupture of the flexor tendons secondary to pisotriquetral osteoarthritis has been reported previously in the scientific literature. We present an interesting case, in which this attritional rupture was preceded by symptoms of carpal tunnel syndrome and several steroid injections.

Case Report: A seventy-nine year-old right-handed lady presented to the trauma clinic with a seven-week history of an inability to flex her dominant little finger. She had not had any previous wrist pain, but had been treated on two occasions for carpal tunnel syndrome with a steroid injection into the carpal tunnel. The most recent episode was three weeks prior to the injury.

Following radiological investigation the patient was consented for surgery, which revealed florid tenosynovitis with the carpal tunnel, a ruptured FDP to the little finger, an intact but low volume FDS to the little finger and a severely abraded FDS to the ring finger. The pisotriquetral joint was directly open to the carpal tunnel and severely arthritic; the pisiform was consequently excised. Total synovectomy, debridement and tenolysis of the flexor tendons were completed. The patient recovered uneventfully.

Discussion: There are three case reports and one case series which describe pisotriquetral osteoarthritis causing flexor tendon rupture. Although this is a rare complication of intercarpal osteoarthritis, this case demonstrates why flexor tenosynovitis should not be forgotten in patients who present with symptoms of carpal tunnel syndrome.

7 Treating keloid scars following syndactyly release

Mr R Choa, Mr A Bashir, Mr D Martin, Mr K Chakrabarty (London)

Introduction: Keloid scarring is a rare complication of syndactyly release in the hands and feet, with less than twenty reported cases in the worldwide literature. We present a case of keloid scarring following syndactyly release, the management and the outcome achieved.

Material: The patient was a three-year-old girl who underwent syndactyly release between the right index and middle fingers. Initial healing was uneventful, with no dehiscence or infection. Eight weeks following surgery, thickened scars were noted, which progressed to extensive keloids by five months post-operatively. She underwent application of pressure garments, silicone treatment and repeated steroid injections. This had limited effect and the patient therefore underwent excision of the scars, full thickness skin grafting to the defects and immediate methotrexate treatment.

Results: Treatment involved surgery with immediate commencement of a six-week course of low-dose (0.3mg/kg) methotrexate. At five months following surgery, no evidence of recurrence was noted, with soft asymptomatic scars, as expected around skin grafts applied to the hands. At nine months the scars had matured further, and it was noted the patient was increasingly using her affected hand.

Conclusions: Our findings concur with those in the literature, that successful management of this difficult problem can be achieved by combining full-thickness grafting with methotrexate. Furthermore we also found that our patient had a degree of macrodactyly of the affected digits, which has been demonstrated to have more than a five hundred fold increase in relative risk for keloid formation in patients with syndactyly.

8 An analysis of post-operative cold sensitivity in patients after surgery for Dupuytren's contracture

Dr P Shepherd, Mr D Fulford, Mr R Parmar, Mr P Wykes (Bolton)

Introduction: Cold sensitivity (CS) is a well-known complication of hand trauma. However, there is very little research into the occurrence of CS after surgery for Dupuytren's contracture. We aim to assess the occurrence of CS patients who had surgery for Dupuytren's contracture and to identify any predisposing factors.

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Methods: Patients who had surgery for Dupuytren's contracture were prospectively recruited and independently assessed at therapist-led post-op clinics. Information regarding the procedure and complications were obtained. Patients were asked if they had CS and possible risk factors were also recorded.

Results: Out of thirty-one patients, 11 (36%) had CS at 4 months post surgery.

	Cold sensitivity	No cold sensitivity
Smoker	72%	5% (p=0.08)
Palmar and digital disease	100%	65%
Correction arc achieved	57°	48°
Age	69	68

Conclusion: Cold sensitivity is common after surgery for Dupuytren's contracture. Our results suggest smoking could increase the risk of CS. Although not conclusive, the degree of correction obtained and the extent of the disease requiring surgery seems to increase the risk of post-operative CS. We propose this may be due to greater surgical insult. Further work with greater numbers needs to be done.

9 Transverse ligament involvement in Dupuytren's contracture: An unusual pattern of disease

Mr A Molajo, Mr A Mishra, Mr I Khan (Liverpool)

Introduction: Dupuytren's contracture is a potentially debilitating condition which presents to hand surgeons. Understanding of the patho-anatomy is essential for systematic management of the condition. McGrouther et al published detailed fresh cadaveric anatomical studies of Dupuytren's diseased hands and the presence of a three-dimensional matrix of longitudinal, transverse and vertical ligaments. The transverse ligaments are usually spared from involvement.

Method: We report a case of a seventy-three year old right handed male retired chemist with Dupuytren's contracture. He previously underwent release of left hand disease a decade earlier and the right little finger seven years earlier. At presentation he was unable to place his hand flat on the table (fixed flexion deformity MCPJ and PIPJ). It was noted that he had very thick and tight transverse cords on his right palm. A thorough consent process was completed. He elected for surgery. Risks and benefits were explained.

Results: Surgery was performed under general anaesthetic and tourniquet control. The thick transverse cords were noted at surgery. Fasciectomy was performed preserving neurovascular structures. Complete correction was achieved.

Conclusion: We report an unusual pattern of Dupuytren's contracture. This case highlights the importance of patho-anatomy in the treatment of Dupuytren's contracture.

10 Management of the acute fingertip injury with subungual haematoma - A systematic review

Mr B Dean, Mr G Becker, Mr C Little (Oxford)

Introduction and Aims: The management of the acute traumatic fingertip subungual haematoma is controversial. We hypothesised that there would be no evidence to support the exploration and surgical repair of the nail bed over trephination or other non-operative techniques.

Material and Methods: Multiple library and online databases were interrogated for relevant studies. Papers reporting the management of tip laceration past the proximal nail fold, soft tissue loss or nailplate damage were excluded. Studies without follow-up were also excluded.

Results and Statistics: The initial search produced seven hundred and sixty-one papers, of which four met the study inclusion criteria. The first was a pseudo-randomised study comparing trephination with nail bed exploration and repair; the second pseudo-randomised patients to undergo one of three different methods of subungual decompression; the third followed a cohort of patients managed by trephination; the last was a retrospective series of cases managed by trephination.

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The complication rate for all forms of treatment was low. The outcomes for nail cosmesis were generally good and this was independent of the treatment method, although the assessment tool used was varied. Infection rates ranged from 0% to 4.2%.

Conclusions and Clinical Reference: Final nail cosmesis does not appear to be affected by the mode of treatment. The acute painful subungual haematoma should be decompressed by trephination or nailplate removal. There is a need for a suitably sized randomised controlled trial comparing nail bed exploration and repair with trephination for the acute fingertip subungual haematoma, with adequate follow-up.

11 **Alternative indications for the ligamentotaxor device: A report of four cases**

Mr R MacFarlane, Ms S Gillespie, Ms F Cashin, Mr A Mahmood, Mr D Brown (Liverpool)

Introduction: The Ligamentotaxor (JB Implants, Rosmalen, Netherlands) was designed for and is mainly indicated for intra-articular PIPJ fractures. We report four cases in which it is used for less common indications.

Methods: All four patients underwent fixation within 14 days and followed a standard rehab regime.

Results:

Case 1: Male, thirty-six years, was hit on ring finger with cricket ball, sustaining distal phalanx pilon fracture. Spent five weeks with device on and subsequent rehabilitation for further 5 weeks. Achieved full ROM and no functional deficit (QuickDASH score 0).

Case 2: Female, forty years, fell onto middle finger, sustaining comminuted distal phalanx fracture with dorsal subluxation at DIPJ. Had device on for four weeks and underwent 16 weeks rehabilitation. The patient achieved a ROM 0°-70° with no functional deficit (QuickDASH 0).

Case 3: Male, fifty-eight years, had fall onto little finger, sustaining an irreducible dislocation of the DIPJ with dorsal and lateral subluxation but no fracture. Ligamentotaxor applied for four weeks, but degenerate change ensued requiring DIPJ fusion.

Case 4: Male, thirty-one years with chronic little PIPJ dislocation. He underwent six weeks with a Ligamentotaxor and a further 6 weeks rehabilitation achieving a full passive ROM, lacking 1cm in active composite movement, and with no functional deficit (QuickDASH score 0).

Discussion: The Ligamentotaxor is a safe and effective device for both fractures and soft tissue injuries of the small joint of the hands. We recommend its consideration in all unstable fracture subluxations and dislocations of the small joints of the fingers.

12 **Dorsal fracture subluxation of the proximal interphalangeal joint: A retrospective study of outcomes**

Mr P Loughenbury, Mr M Singh, Mr D Nikkhah, Mr J Rodrigues, Mr R Pinder,
Mr W De Jager (Bradford)

Introduction: Dorsal fracture subluxation of the proximal interphalangeal joint (PIPJ) is a rare injury and reports of outcomes are limited to a number of small case series. Good results have been reported following treatment with open reduction internal fixation (ORIF), k-wire immobilisation and dynamic external fixation. We provide a review of outcomes in our unit, using all three strategies.

Methods: Retrospective review of medical and physiotherapy notes over two years (August 2008 to August 2010). Timing of surgery, method of fixation, timing of metalwork removal, and post-operative physiotherapy attendance was recorded. Final range of movement (ROM) and fixed flexion deformity (FFD) were used as the main outcome measures.

Results: Eleven patients (9 male, 2 female) included: 4 dynamic external fixation, 3 immobilisation with k-wires, 3 ORIF and 1 elected for conservative treatment (excluded from results). Mean age was thirty-seven (17-58) years. All patients attended standard outpatient physiotherapy. Median follow-up was two months, time to

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surgery was 3 days (2-9) and time in external fixation 28 days (27-31). No complications were reported. Median final ROM was 85° (70-100°) for k-wire immobilisation, 70° (62-80°) for ORIF and 30° (27-38°) for dynamic external fixation. Median FFD was 0° for k-wire immobilisation, 15° (10-33°) for dynamic external fixation and 40° (28-50°) for ORIF.

Conclusion: Results were in line with those published in the literature. In our unit, immobilisation with k-wires appears to provide the best results. There is scope for a randomised controlled trial to compare k-wire immobilisation, ORIF, and dynamic external fixation.

13 "Just put a wire in it"

Mr F Urso-Baiarda, Mr S Southern (Wakefield)

Introduction: Placement of K-wires is sometimes regarded as an easy technique with few complications that can be safely left to junior surgeons, views challenged by a recent intra-departmental audit. Aiming to improve the outcome of this common technique, we present frequently encountered errors in K-wiring and provide guidance on avoiding them.

Materials: These techniques are derived from the accumulated experience of senior hand surgeons within our department. They form the basis of recommendations given to trainees starting their placement with us who have found them useful. We hope that others about to start or having recently started K-wiring independently will benefit from applying these practical and conceptual techniques.

Results: The assessment of fractures for stability and selection of fixation technique, the aims of K-wiring and its limitations are discussed. Common problems encountered in bony engagement include wire slippage and misplacement, both at skin and bone entry points. Excessive wire speed, thermal injury, soft-tissue torsion, loss of three-dimensional orientation and meeting of crossed K-wires at the fracture site are common errors of wire placement. Techniques preventing each of these mishaps are elucidated. Decision-making in post-operative wire management and treatment of complications are also discussed.

Conclusions: Understanding the rationale for fracture fixation by any technique - to permit mobilisation, prevent stiffness and improve outcome - permits logical and appropriate application of K-wire fixation. The difficulty of K-wiring is often under-appreciated and surgeons embarking on this procedure independently may have little prior experience. Application of the techniques described may facilitate these surgical procedures.

14 Outcome in distal radius fractures and length of hospital stay: Is there a place for K-wires?

Mr R MacFarlane, Dr T Whitby, Mr P Mobbs (Liverpool)

Introduction: We compared radiological outcome and length of hospital stay in patients treated with K-wires and those treated with a common anatomical volar locking plate.

Methods: We retrospectively reviewed case notes and radiographs from eighty-three patients treated with either DVR plate or K-wires. Radial shortening and dorsal tilt, at two and 6 weeks post-operatively, and length of stay were recorded.

Results: There were no differences between groups in initial mean radial shortening or tilt ($p > 0.05$), or in age or sex distribution ($p > 0.05$). However, elderly patients had a significantly longer length of stay with a plate ($p = 0.0002$), but in other age groups and fracture patterns there was no significant difference. At two weeks post-operatively mean shortening was 0.48mm versus 2.47mm ($p = 0.00031$) and dorsal tilt was 1.92° volar, versus 2.2° dorsal ($p = 0.16$). At six weeks the mean shortening was 1.1mm versus 3.82mm ($p = 0.000104$) and the mean dorsal tilt was 1.4° volar versus 7.8° dorsal ($p = 0.005$). In patients over sixty-five, mean shortening at 6 weeks was 1.03mm versus 4.1mm ($p = 0.0001$) and mean tilt was 1.1° volar versus 10.9° dorsal ($p < 0.0001$). In patients with comminuted fractures (AO type C2-3) mean shortening at six weeks was 1.03mm versus 4.0mm ($p = 0.002$) and mean dorsal tilt was 1.64° volar versus 10.2° dorsal ($p < 0.01$).

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Discussion: Improved outcome at six weeks is seen with an anatomical plate, with no difference in length of stay other than in the elderly. We recommend a plate for all but simple injuries and that length of stay is a secondary consideration.

15 A comparison of incidence of finger tip pain in AO lag screw and headless compression screw distal interphalangeal joint arthrodesis

Dr A Ayub, Mr P Chapman (Norwich)

Aims: To compare the incidence of finger tip pain in headless compression screw and simple AO lag screw distal interphalangeal joint arthrodesis.

Method: Fifteen arthrodeses using a simple AO lag screw and 12 using a headless compression screw, either an Acutrack screw or similar headless compression screw, were carried out in a teaching hospital. The computerised notes of each patient were searched to find any noted complications and the final QuickDASH score.

Results: The difference in terms of frequency of finger tip pain between these two treatment groups was found to be not statistically significant ($p=0.916$, Chi Square =0.011). The average QuickDASH scores for these two groups were also not significantly different ($p=0.877$ with a 95% CI, unpaired t test).

Conclusion: The conclusion of there being no difference in terms of finger tip pain is clear and therefore the extra expense of the headless compression screw cannot be justified. It also strongly suggests that the occurrence of finger tip pain is directly related to the incision at the distal finger tip through which the screw is inserted, therefore rather than metal work removal, it may be prudent to wait for a longer period of time to assess whether this settles without any treatment.

16 Quick onset long acting brachial plexus blocks in hand surgery

Mr M Saleh, Mr A El Gawad, Dr A Logan, Mr F Fahmy (Chester)

Purpose: Axillary brachial plexus blocks are our standard form of anaesthesia for hand surgery. This has largely replaced the need for a general anaesthetic. We hereby present our technique, describing a new formula of injection that permits a fast acting block without the need to wait as with the usual local anaesthetic used in most brachial plexus blocks.

Methods: A retrospective audit was done for the last six months. Thirty-six patients were included. Age: 25–67 years. The surgical procedures were Dupuytren's contracture, surgery for the arthritic hand, tendon surgery and bone surgery. Data was collected through a questionnaire which included the time lapse from anaesthetics administration to the start of operation, patient satisfaction rate of the anaesthesia, and the need for post-operative pain control.

Results: Analysis of our data demonstrates minimal lapse time and high satisfaction rate.

Conclusions: This new formula offered an effective and rapid onset anaesthesia as well as long lasting post-operative pain control. This enabled a high turnover of the list with minimal delays between cases, maintained post-operative pain relief and hence a quicker recovery. The patient satisfaction rate was high.

17 CMI pyrocarbon hemiarthroplasty for trapeziometacarpal joint arthritis

Mr E Spurrier, Mr J Jones, Mr G Pathak (Peterborough)

Introduction: The CMI pyrocarbon implant is an uncemented hemiarthroplasty for trapeziometacarpal joint arthritis which is implanted into the thumb metacarpal. Previous case series have reported significant pain relief and good patient satisfaction. It has been suggested that hemiarthroplasty should provide greater grip strength than trapeziectomy. We report the first cases from Peterborough.

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Method: Thirty-six cases in 31 patients were retrospectively reviewed. The average patient age was fifty-nine years (range 40-73). Post-operative grip and pinch strength were recorded and patients were given a questionnaire, including PEM and QuickDASH scores.

Results: Most patients in whom the implant survived were afforded good pain relief. Radiologically all but three implants were subluxed by at least 30%. Five implants were revised. One implant was revised after dislocation and loosening associated with trauma but made excellent progress after revision of the prosthesis. Two implants dislocated without trauma; one was revised to a CMI implant and one was revised to trapeziectomy. One was revised to trapeziectomy at 15 months due to continued pain. The average three point pinch strength in the operated thumb was 6.3kg, which was on average 89% of the contralateral thumb. This is broadly comparable with the outcomes reported in trapeziectomy.

Conclusions: These results suggest that this implant affords good pain relief and functional improvement in managing OA at the TMC joint, although there is a risk of dislocation. In this series, outcomes were broadly comparable to trapeziectomy, although a larger controlled trial is recommended.

18 Improving productivity and income in hand surgery operating lists by the strategic employment of extra theatre personnel

Dr R Popat, Mr G Bhabra, Mr A Smith (Margate)

Introduction: Recent evidence clearly demonstrates that theatres are not being utilised optimally.^{1,2} It has been reported that approximately 60% of time spent in theatre is actually used for operating, with 21% of time spent on patient turn over.³ Guidance from the Association of Anaesthetists of GB and Ireland identified optimal staffing levels as essential to maximising theatre efficiency.⁴ We therefore aimed to assess the impact of a change in theatre personnel in our hand surgery lists, on theatre efficiency and income generated for the trust.

Methodology: In an attempt to increase patient turn-over, a dedicated porter was employed to transfer patients to and from theatres, and a band 5 nurse was employed to assist with patient preparation and wound closure. We analysed the orthopaedic hand surgery lists that were performed in the six months before and 6 months after the implementation of the change in personnel. We compared the volume of procedures performed during each period and the income that was generated for the hospital.

Results:

	Average no. of procedures per list	Average income per list	Added cost per list
Before change	5.8	£12,176	£0
After change	8.15	£15,585	£216
Difference	2.35	£3,409	£216

The extra income generated per list was £3,193 (or a 26% increase in income).

Conclusion:

- Employing a porter and band 5 nurse, dedicated to our list, resulted in substantial improvements in our productivity.
- The intervention resulted in an extra of 2.35 procedures per list.
- The overall extra income generated per list was £3,193.

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19 **Medium term results of total elbow replacment**

Mr S Elnikety, Mr B Singh, Mr M El-Husseiny, Mr T Kamal, Mr G Talawadekar,
Mr C Brooks, Mr R Wetherell (Ashford)

Introduction: In this study we reviewed all total elbow replacements (TER) done in our hospital over an eight-year period (1997-2005). Twenty-one patients (16 females, 5 males) were available for follow-up. Four were lost to follow-up (two died and two moved out of the region). The average age was sixty-five years. Sixteen patients had the procedure for rheumatoid arthritis and 5 patients underwent the procedure for post-traumatic arthritis. The average follow-up was sixty-one months.

Methods: The Mayo Clinic index, the DASH scores and activities of daily living (adopted from Secec Elbow Score) assessment tools were used. In addition, all patients were assessed for loosening, using standard AP and lateral radiographs. Sixteen patients had Souter-Starthclyde prosthesis whilst three had Kudo and two had Conrad-Moorey prosthesis.

Results: All procedures were done through dorsal approach, the ulnar nerve was not transposed in any of the cases. The average elbow extension lag was 27° with flexion up to 130°. Supination was 65° and pronation was 77°. The average DASH score was 51.3, the Mayo elbow score was 82 and the average Activities of daily living Secec Score was 17.

Discussion: There were four complications. Three ulnar nerve paresis which recovered, and one wound complication which needed a flap cover. Two needed revision surgery, one for a periprosthetic fracture and one for loosening. Two patients showed radiological signs of loosening but were asymptomatic. Our study proves TER has good medium term results with good functional outcome and high patient satisfaction rate.

20 **Patient satisfaction in a single UK plastic surgery unit: Are we doing enough?**

Mr R Kulkarni, Mr M Singh, Mr J Tan, Miss M Mughal, Mr M Timmons (Bradford)

Introduction: Patient-reported outcome measures (PROMS) and patient satisfaction have become increasingly important over the last few years. Our aim was to assess patient satisfaction with the doctor-patient interaction, the post operation explanation and the overall experience.

Methods: Retrospectively completed questionnaires by patients who underwent an operative intervention. One hundred questionnaires were collected over a two-month period, with 71 trauma, most involving injury to the hand, and 29 elective patients, hand and general plastics cases.

Results: The majority of trauma patients (29%) waited more than two hours, compared with 30-60 minutes for elective patients, to be assessed on arrival. At assessment, the doctor introduced themselves in 99% of cases, and was thought of as polite and acting in a professional manner in 100% of cases. They were seen washing their hands by 90% of patients. Post-operative findings were explained in 97% of cases, with post-operative care instructions given to 93%. Overall, 98% of trauma and 100% of elective patients reported that they were satisfied with the entire experience.

Conclusion: Despite areas for improvement, such as waiting times, patients reported high overall satisfaction, with a larger emphasis placed on the doctor's manner and professionalism. We therefore suggest that the doctor-patient interaction may play a significant role in the patient's overall satisfaction of the treatment received.

21 **Landmarks for rotational alignment of the humeral component during elbow arthroplasty**

Dr M Sabo, Dr G Athwal, Dr G King (Wigan)

Introduction: Rotational orientation of the humeral component during elbow arthroplasty is typically referenced using the articular surface or epicondyles. With bone loss, these landmarks may be compromised.

We assessed whether the flat posterior humeral cortex proximal to the olecranon fossa is a reliable landmark to orient the humeral component during elbow arthroplasty.

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Methods: Fifty cadaveric elbows (mean age 73 ± 12 years) underwent CT scans. The flexion-extension axis (FEA) was determined using a sphere-fit of the capitellar surface and a circle-fit through the narrowest portion of the trochlea. The posterior humeral cortical line (PCL) was drawn just proximal to the olecranon fossa. The transepicondylar axis (TEA) was determined by a line between the most prominent point on each epicondyle. Angles between the PCL and FEA and the TEA and FEA were calculated.

Results: The PCL was externally rotated by $14.0 \pm 4.2^\circ$ ($p < 0.001$) relative to the FEA (males $12.6 \pm 3.6^\circ$, females $16.4 \pm 5.2^\circ$, $p = 0.002$). The TEA was externally rotated by a mean of $2.8 \pm 3.5^\circ$ ($p < 0.001$) relative to the FEA (males $2.7 \pm 3.4^\circ$, females $2.6 \pm 3.7^\circ$, $p = 0.96$). The intra and inter-observer reliability for the capitellar and trochlear centers was > 0.98 , while the cumulative intra and inter-observer reliability was 0.8 and 0.5 for the FEA-PCL angle, and 0.4 and 0.3 for the FEA-TEA angle.

Conclusions: The PCL is a reproducible landmark that is externally rotated with respect to the FEA. The surgeon must consider the need for a correction factor and consider the influence of gender on this correction when using the PCL as a landmark to avoid component malrotation.

22 A modification of the Souquet and the Hueston skin rotation flaps in fingertip reconstruction

Miss N Lloyd, Mr D Sammut (Windsor)

Transverse amputation defects in the fingertips can be reconstructed by one of a variety of flaps. The ideal flap has a mechanical quality identical to the skin being replaced, is sensate and preferably homodigital.

The Hueston flap is a random rotation transposition flap that rotates local skin to cover the defect. It is dissected in a plane which does not include the nerve and vessel in the leading edge. The leading half of the flap is thus insensate. The exclusion of the leading edge NV bundle ensures ample movement at the cost of loss of sensation. This feature also requires that the flap be based on the leading edge of a digit and may limit its application.

The Souquet Flap is identical in design but includes the neurovascular bundle in the leading edge. This maintains full sensation at the cost of limiting freedom of movement and rotation arc.

We describe a modification, extending the leading edge by midlateral incision to enable mobilisation of the neurovascular bundle. The bundle is included in the leading edge of the flap, but the mobilisation of the pedicle affords an ample transposition arc, while retaining full sensation. This distils the best advantages of either flap into one method.

A brief review of common methods will be presented and the operative procedure described in detail.

23 Educational hand model - A novel teaching tool in the design and implementation of local hand/finger flaps

Mr A Gilmour, Miss R Taghizadeh, Miss C Payne (Newcastle upon Tyne)

Introduction: Implementation of the EWTD in times of NHS rationing and increased service commitments will inevitably reduce the exposure of trainees to plastic surgical cases. Practical teaching opportunities should be provided as an alternative to ensure maintenance of skills. We describe our use of a simulated latex hand model in the education of plastic surgery trainees on the subject of local flaps.

Methods: An "educational-hand" was constructed, utilising a pliable mannequin hand layered with coloured latex and vascular sloops, to demonstrate the fascial planes and axial vessels essential to raising local and perforator flaps to reconstruct hand/finger defects.

Results: The above model was coupled with didactic lectures in a regional teaching session to demonstrate the design, raising and execution of a multitude of flap options used in hand and finger reconstruction. The teaching methods were analysed using a Likert scale feedback questionnaire.

Conclusion: There may be little opportunity to visualise or perform these operations within the restriction of the NHS. Surgery is a practical skill that needs tangible teaching in the "classroom" setting. Development of practical tools, such as our educational hand model, to increase trainees' understanding of flaps is the way forward.

NOTES

POSTERS

24 A palmar approach to insertion of a free phalangeal transfer in symbrachydactyly

Dr L Garagnani, Mr D Sammut (Windsor)

Free phalangeal transfer of an entire toe phalanx is an accepted procedure in the array available for digital lengthening in symbrachydactyly.

In this condition, the digits consist of variably sized empty skin envelopes, with, frequently, a flexion deformity, due to relative shortage of palmar soft tissues. The described techniques of free phalangeal transfer all use a dorsal approach to this skin envelope. The result is frequently compromised by the persistent flexion deformity of the now augmented digit.

We present a new, palmar, V incision to approach this space, which provides excellent access, facilitates insertion of the whole phalanx, good exposure of contracted palmar soft tissues which require division and also enables closure of the V into a Y, thus achieving lengthening of palmar skin.

The technique is described and illustrated by means of a number of cases.

25 A three-step technique to identify the trapezium without the need for intra-operative fluoroscopic imaging

Mr W Jamil, Mr A McMurtrie, Dr P Nesbitt, Mr L Muir (Manchester)

Thumb pain secondary to degenerative arthritis of the carpometacarpal joint of the thumb (basal joint) is a common disabling condition, affecting approximately 25% of women and 8% of men between the ages of 50 and 65. The key principles of successful basal joint arthroplasty involve trapezial excision, which is required for pain relief, and some form of ligament reconstruction. The majority of basal joint reconstructive procedures include partial or complete trapeziectomy, some type of tendon transfer and ligament reconstruction, with or without tendon interposition and/or pin fixation.

When performing a trapeziectomy it is important to identify the trapezium correctly before excising it. This can occasionally be difficult particularly if surgeons are inexperienced. We are aware, anecdotally, of at least two cases in the United Kingdom where an incorrect bone has inadvertently been excised. Excision of the incorrect bone during trapeziectomy for basal joint arthritis of the thumb has been reported within the NHS litigation authority database.

We describe the senior author's routinely used three-step technique to confirm the identity of the trapezium before excision. This technique has been reliably used in over three hundred cases with successful excision of the trapezium without intra-operative fluoroscopy.

26 Stabilisation of the unstable extensor carpi ulnaris tendon - Surgical technique

Mr P Sauv , Mr C Heras-Palou, Dr M Garcia-Elias (Portsmouth)

Introduction: We describe a new method for stabilisation of the unstable extensor carpi ulnaris (ECU) tendon. Our technique stabilises the ECU tendon by using an ulnar based, capsular flap from the floor of the sixth extensor compartment.

Methods: Via a dorsal approach, the extensor retinaculum is opened to expose the contents of the sixth extensor compartment. The damaged ECU subsheath is opened and the tendon is retracted to exposure the floor of the sixth extensor compartment. A rectangular, ulnar based, dorsal capsular flap of the DRUJ is then raised from the 4/5 intercompartmental septum. The flap is raised sufficiently ulnarwards to allow the ECU tendon to be replaced back in its groove, albeit now under the capsular flap. The flap is then replaced and repaired back to the septum.

Results: We report a small series of three patients (2 male, 1 female; 32, 27 and 40 years of age respectively) that underwent this procedure (follow-up of 58, 27 and 13 months). All three patients regained functional pronosupination, with full grip strength and less than 20° lack of pronation.

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Conclusions: This technique maintains the relationship between the ECU tendon and the distal ulna throughout pronosupination, thus eliminating the patient's symptoms. Previously described techniques rely on extensor retinacular flaps to stabilise the subluxing tendon. Since the extensor retinaculum takes origin from the radius alone, and not the ulna, the ECU tendon cannot maintain its close relationship to the ulnar groove throughout pronosupination thus potentially causing recurrence of instability.

27 **Use of string wrapping in difficult ring removal**

Mr A Allouni, Mr J Pollock, Mr N Brierley, Mr S Majumder (Wakefield)

Introduction: With hand injuries being one of the most frequent presentations to the emergency department, ring removal from a swollen digit is an often encountered problem. In our experience, staff often resort to cutting rings off, rather than utilising string wrapping - a simple and effective technique that does not damage the ring. We aimed to determine the methods known and used by the staff of emergency departments for ring removal in the United Kingdom.

Methods: Forty-six personnel, working in the emergency departments of three district general hospitals, completed a paper questionnaire comprising known and used methods of difficult ring removal.

Results: Over 78% of the staff surveyed would use a ring cutter as their second choice method, after failure of soap and water. Although 67% of responders had heard of the string wrapping technique, only 52% of these had ever used it, and only 13% would consider the method as a first choice. Lack of training, experience and materials were cited as reasons not to use the technique.

Discussion: Rings are often expensive or sentimental items and, although clinical need dictates removal in hand trauma, they are often unnecessarily damaged. We present the technique of string wrapping to the conference as a simple, cheap, quick and effective method of difficult ring removal, and advocate members to publicise it to their emergency departments.

28 **The Open Sky technique of exposure of the flexor canal**

Mr D Sammut, Mr D M Evans (Windsor)

Flexor tendon surgery is technically demanding and the outcome depends on multiple factors, including integrity of repair, smooth gliding surfaces, atraumatic technique, expert rehabilitation and preservation of anatomical structures with vital biomechanical function, including the pulley system.

Maintenance of integrity of the pulleys is accepted as an essential element of technique. This poses problems of exposure and difficult access. The many described methods of tendon retrieval and manoeuvres beneath intact pulleys, during tenorrhaphy or tenolysis, as well as the debate on the venting of pulleys, testify to the difficulties posed by the cardinal principle of pulley integrity.

We present a new method of exposure of the flexor canal by incision and reflection of the pulley and simple, reliable, reconstruction which resolves this technical difficulty. The entire flexor canal can be visualised and the technique affords far less traumatic surgery, whether this be repair, tenolysis, tendon graft or re-insertion. Some aspects of flexor surgery, which would otherwise be impossible, are rendered possible. The method also has application in the exposure of difficult fractures.

The rehabilitative programme requires no modification. The operative technique is described and demonstrated in detail. A small clinical series is presented.

29 **Validation of The Liverpool Flexor Tendon Training Model: A step-by-step approach to learning**

Mr A Hweidi, Ms J McPhail, Mr D Bell, Professor P McArthur (Liverpool)

Introduction: Before a teaching model can be integrated into an educational programme, it is recommended that its validity be determined. We developed an accessible training model for flexor tendon surgery with all the key steps of the procedure. The aim of this study was to validate the model.

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Method: A training module was delivered to fifteen junior plastic surgery trainees on flexor tendon surgery to allow development of surgical skills in this field in a staged and progressive manner. OSATS (Objective Structured Assessment of Technical Skills) was used to assess performance pre and post-training on fresh frozen cadaveric hands simulating live surgery. Assessment was performed by a faculty of hand surgeons. The paired Student's T-test was used to compare OSATS score and time taken to accomplish the task pre and post-training.

Results: There was an improvement in mean performance comparing the procedure specific checklist score and the Global rating scale (2 components of the OSATS system) pre and post-training. Moreover there was a significant incremental shortening in mean times to complete the task.

Conclusion: This model can provide the hand surgery community with an accessible, cost effective and valid way to teach a fundamental procedure in hand surgery.

30 The results of arthroscopic synovial excision for dorsal wrist pain in hyperextension

Mr D K Jain, Mr J Robinson, Mr N Chitnis, Mr R Singh (Wrexham)

Introduction: Arthroscopic excision of dorsal hypertrophic synovium was performed on patients with dorsal wrist pain in hyperextension. Although there is a cadaveric description of dorsal wrist impingement, to our knowledge, there are no published clinical results. We present the results of arthroscopic management of the condition in our hospital.

Material and Methods: Between 2008 and 2010, thirteen patients underwent arthroscopic excision of the hypertrophic dorsal impinging synovium. All presented with the cardinal symptom of dorsoradial wrist pain in extreme extension. Diagnosis was made after excluding other causes and was confirmed on wrist arthroscopy. Arthroscopy was offered after non-operative measures failed. Post-operative follow-up ranged from six to 24 months with a mean of 14 months.

Results and Statistics: The mean pre-operative quick DASH score was 49 ranging from 34 to 82 and the mean post-operative quick DASH score was 17 ranging from 0 to 48, paired t-test revealed a significant difference between the two with the p value being less than 0.001. Mean post-operative flexion-extension arc was 113° and radial-ulnar deviation arc was 44°. Post-operatively, one patient developed complex regional pain syndrome with tethering of the dorsal branch of the ulnar nerve, which needed surgical release. Another patient needed revision arthroscopic excision of impinging tissue. Both had good outcome.

Conclusions: Dorsal wrist impingement should be one of the differential diagnoses while treating patients with dorsal wrist pain. Arthroscopic excision of the impinging synovium achieves reliable pain relief with significant improvement in DASH score.

31 Outcomes of conservatively treated distal radius fractures in an Asian population

Dr B Lin, Professor L Teoh, Dr K Chee (Singapore)

Purpose: We aim to investigate the outcomes of conservatively managed distal radius fractures and the impact closed reduction has on the anatomical alignment and functional outcome.

Methods: All patients with distal radius fractures that presented to Tan Tock Seng Hospital, Singapore, from April 2009 to January 2010, and received conservative treatment were selected from our prospectively collected database. Radiological measurements were taken at presentation, post reduction if closed reduction was performed and at follow-up periods of six weeks to 3 months. The radiological results were analysed to determine if fracture alignment remained within acceptable limits. The Disabilities of the Arm, Shoulder and Hand (DASH) score was also taken to assess if this translated into a difference in function.

Results: Fifty-four patients, mean age 66.1 years, with type A fractures according to the AO classification were studied. Twenty-five received closed reduction and casting and 29 were treated with casting alone. After comparing initial and final outcomes at follow-up, neither anatomical alignment nor DASH scores were significantly different between these two groups.

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Conclusion: Closed reduction did not improve final anatomical alignment or functional score in our patient group.

32 **Predicting successful outcomes of wrist and finger ganglia managed in a tertiary referral setting**

Miss K Rollins, Mr B Ollivere, Mr P Johnston (Cambridge)

Ganglia are the commonest cause of swellings of the hand and wrist. There is huge variety in the success of documented outcomes in management of ganglia.

Conservative management has been shown to be associated with spontaneous regression rates of 33% to 45%. Aspiration results in fifty-nine to 88% recurrence compared to 10 to 40% for excision. There is little published data surrounding those patients likely to benefit from each treatment modality. In a climate of increasing health economic constraints we sought an evidence basis for referral criteria and treatment decisions.

A retrospective series of thirty-seven patients with hand and wrist ganglia, referred to a single hand surgeon in a two-year period, was examined in order to determine predictors of successful treatment. Twenty-six ganglia were located at the wrist; 7 managed conservatively, 13 aspirated and 6 underwent surgical excision. Six cases recurred, subsequently half underwent conservative management and half surgical excision.

Of the twelve finger ganglia, one was managed conservatively, 9 by aspiration and 2 by surgical excision. There were two cases of recurrence following aspiration, both of which then had excision. Duration of symptoms less than one year was significantly associated with successful treatment ($p=0.0021$). Primary aspiration was not significantly predictive of successful outcome ($p>0.05$; NPV=0.83). Predictors of treatment success included male gender (PPV=71.4) and pain (PPV=81).

Overall success rates were 75% for aspiration of wrist ganglia and 80% in finger ganglia. Duration of symptoms for less than a year was 92% sensitive for successful treatment.

33 **Does the dart thrower's motion apply to all activities of daily living?**

Dr A Gilmour, Professor J Richards, Mr D Redfern (Preston)

Introduction: The "Dart Thrower's Motion" (DTM) has been defined as "a plane in which wrist functional oblique motion occurs, specifically from radial extension to ulnar flexion". The DTM is supposedly involved in many activities of daily living (ADL) and may have had a role in human evolution. We aimed to compare the oblique plane of motion used to perform three standardised tasks, using 3D motion analysis technology.

Methods: We recruited nine volunteers (age range 22-45), each of whom performed two simulated ADLs: using a door knob and a door lever. The ADLs were simulated using a work-sim kit on an isokinetic dynamometer. Motion analysis was performed by a 10-camera Oqus system (Qualisys Medical AB, Gothenburg, Sweden). The kinematic data was exported to Visual 3D (C-Motion Inc.), where a biomechanical model was created and joint kinematics calculated. The ROM for all subjects was pooled and sagittal/coronal angle-angle diagrams were created.

Results: We found that using a door knob utilised a plane of radial-extension to ulnar-flexion. However, we observed that using a door lever utilised a plane of ulnar-extension to radial-flexion, opposite that of the DTM.

Clinical Relevance: Authors have recommended performing a radio-carpal arthrodesis, as opposed to a mid-carpal arthrodesis, in order to preserve mid-carpal function and thus, the DTM. We have demonstrated that two similar tasks are performed using opposite oblique planes of motion. We feel that further investigation is required to assess whether the DTM is actually used in a broader range of modern ADLs.

NOTES

MEETING INFORMATION

REGISTRATION

Important notice: Doctors or scientists engaged in research AND presenting a paper will not be charged a registration fee for the day they are presenting, if they can confirm in writing that they have no access to study leave expenses. They must, however, pay £40 per day. This is the day delegate rate charged to the Society by the venue for each individual attending.

Exemption from payment of registration fees is not available to those who have access to study leave. If all study leave for the year has been utilised, full registration fees must be paid.

REGISTRATION FEE

Full / Overseas / Associate Members who are Consultants	£330 Whole meeting £165 day
Associates who are Trainees / Companion Members / Non-member UK Trainees	£180 Whole meeting £90 One day
Other Non-members	£330 Whole meeting £165 One day
Honorary / Senior Members	£40 per day
Speakers who are Research Doctors or Scientists	£40 per day

On-site registrations do not include a ticket to the Society Dinner.

REGISTRATION AND ENQUIRY DESK

The Registration and Enquiry Desk, (situated in the Foyer on the second Floor of One Great George Street) will be open at the following times:

Thursday	08:15 – 17:30
Friday	08:30 – 14:00

The telephone number of the Registration and Enquiry Desk during the Meeting is: 07930 509 646 (BSSH Mobile).

HONORARY AND SENIOR MEMBERS

Honorary and Senior Members will not pay a registration fee. A charge of £40 will be made for refreshments and luncheon each day. This is the day delegate rate charged to us by the venue for each delegate.

VENUE

VENUE OF SCIENTIFIC MEETING

The meeting will be held in the Thomas Telford Theatre at One Great George Street.

CONGESTION CHARGE

One Great George Street is within the charging area.

CAR PARKING

Parking is available at Westminster City Council's car parks in Abington Street and on the South Side of Trafalgar Square. Limited meter parking is also available in and around adjacent streets.

ACCOMMODATION

No block bookings have been made for the meeting. One Great George Street is in partnership with The Corporate Team to offer delegates some excellent rates at a range of local hotels ranging from 3* to 5*. To book accommodation please visit: www.onegreatgeorgestreet.com/conference_hotels.asp.

LUNCHEON

Luncheon will be served in the Great Hall.

MEETING INFORMATION

CONTRIBUTORS INFORMATION

PROJECTION FACILITIES

There will be facilities for PowerPoint presentations only. The AV will be provided by the in-house AV Department.

Speakers are asked to keep strictly to the time allocated for their presentation.

CONTINUING MEDICAL EDUCATION

The following number of points have been awarded for each day:-

Thursday: 7.0

Friday: 6.0

Total: 13.0

SOCIETY DINNER

Thursday, 20 October

Cruising Down the Thames on the exclusive Symphony to the Phoenix Jazz Band

The boat will depart from Westminster Pier at 19:15 prompt, returning to the Pier at approximately 23:15.

Dress code: smart casual

The Society Dinner is open to Honorary, Senior and Full Members and Associates, all of whom may invite guests. One ticket was included in the registration fee for those who pre-registered for the whole meeting.

PRIZES

POSTER PRESENTATIONS AND POSTER PRIZE

The Society will introduce electronic poster presentations for the first time – there will be no paper posters at the meeting. Posters will be displayed on two plasma screens in the registration and trade exhibition areas on a constantly rotating loop and will also be shown in the lecture theatre during breaks. Each poster will run for two minutes.

A prize will be awarded to the best poster presented at the meeting and the authors will be allocated five minutes in the programme to give a verbal presentation of the material.

JOURNAL OF HAND SURGERY PRIZE

A prize, consisting of book vouchers up to the value of £500.00, will be awarded to the presenter of the best paper at the Meeting.

LECTURES

DOUGLAS LAMB LECTURE

This will be delivered on Thursday at 16:40 by Professor Thomas Brushart, entitled 'Evaluating the outcome of experimental nerve repair'.

HUNTERIAN LECTURE

This will be delivered on Friday at 12:20 by Professor Tim Davis, entitled 'Acute scaphoid waist fractures – Prediction of outcome with non-operative treatment'.

KEYNOTE LECTURES

Friday, 09:45 'Update on Dupuytren's disease and collagenase' by Professor L Hurst

Friday, 11:30 'Dupuytren's: What trials need to be done?' by Professor P Werker

Friday, 11:50 'Allotransplantation' by Dr A Bishop

Friday, 14:05 'Vascularised bone grafts to the upper extremity' by Dr A Bishop

MEETING INFORMATION

MEETINGS

BSSH ANNUAL GENERAL MEETING

The BSSH Annual General Meeting will be held on Friday, 21 October at 09:00 in the Thomas Telford Theatre (open to Members and Associates only).

MEETINGS IN 2012

3-4 May: Royal College of Surgeons, London

11-12 October: Royal York Hotel, York

MEDICAL AND TECHNICAL EXHIBITION

Firms supplying instruments, appliances, materials and books will be exhibiting throughout the two days in the Great Hall, where refreshments and luncheon will be served. It is hoped that everyone will support this exhibition.

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KARL STORZ ENDOSCOPY (UK) LTD 392 Edinburgh Avenue, Slough SL1 4UF Telephone: 01753 503 500, Fax: 01753 578 124, Email: sanderson@karlstroz-uk.com Contact: Mr S Anderson	STAND NO 12
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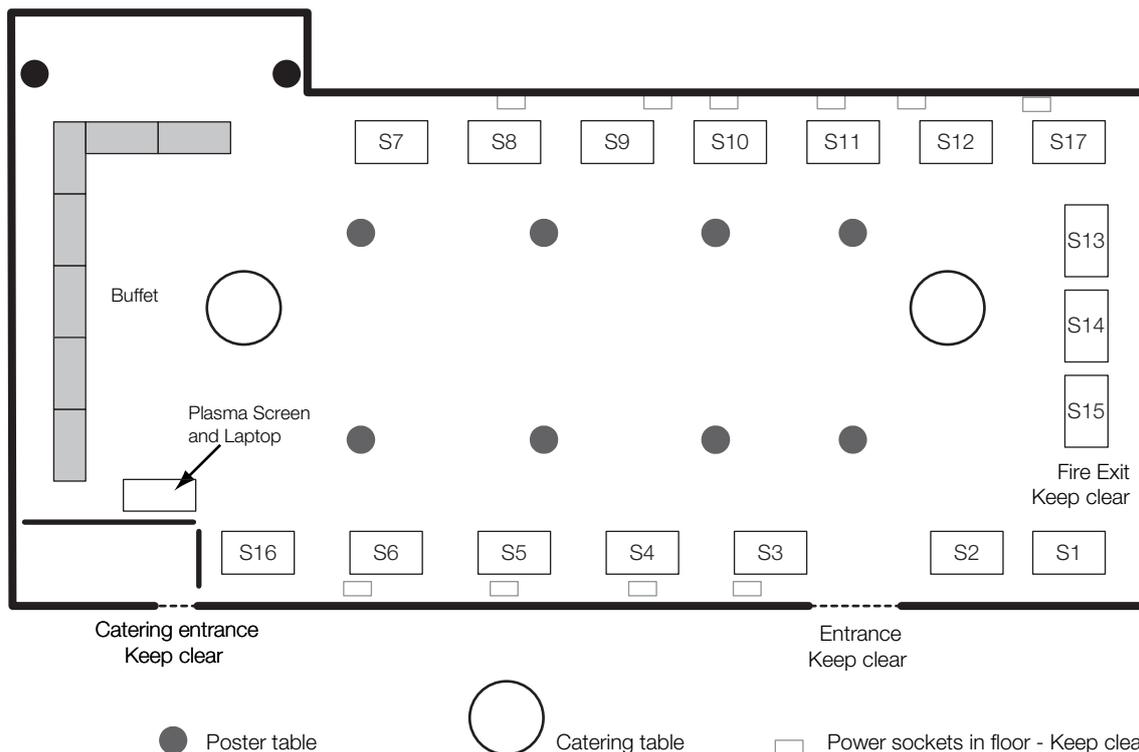
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STAND NO 14

TRADE EXHIBITION FLOOR PLAN

Great Hall (not to scale).



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XIAPEX[®] Abbreviated Prescribing Information:

(See Xiapex Summary of Product Characteristics for full Prescribing Information)
Presentation: Powder and solvent for solution for injection for intraligamentary use. The vial of powder contains 0.9mg collagenase *clostridium histolyticum*. The powder is a white lyophilised powder and the solvent is a clear colourless solution. **Indications:** Treatment of Dupuytren's contracture in adult patients with a palpable cord. **Dosage:** Xiapex must be administered by a physician appropriately trained in the correct administration of the product and experienced in the diagnosis and management of Dupuytren's disease. The recommended dose of Xiapex is 0.58mg per injection into a palpable Dupuytren's cord. For an MP joint, each dose is administered in an injection volume of 0.25ml (requiring 0.39ml solvent for reconstitution). For a PIP joint, each dose is administered in an injection volume of 0.20ml (requiring 0.31ml solvent for reconstitution). Approximately 24 hours after injection, a finger extension procedure may be performed to facilitate cord disruption. If a satisfactory response has not been achieved, injections and finger extension procedures may be repeated up to 3 times per cord at approximately 4-week intervals. Only one cord must be treated at a time. **Contraindications:** Hypersensitivity to the active substance or to any of the excipients. **Warnings and Precautions:** **Allergic reactions** - 17% of Xiapex-treated patients in phase 3 placebo-controlled clinical studies had mild allergic reactions (i.e. pruritus). Physicians must be prepared to address any severe local or systemic allergic reactions including the potential for anaphylaxis following injection, including the potential for such reactions following repeated use. Whilst there is no

evidence from the clinical data of an increased risk of serious allergic reactions upon repeated injections, the potential for such reactions following repeated use cannot be excluded. **Tendon rupture or other serious injury to the injected extremity** - Injection of Xiapex into collagen containing structures of the hand other than the Dupuytren's cord may result in damage to those structures including possible tendon rupture or ligament damage. Injections into cords affecting the PIP joint of the 5th finger must not be more than 2 to 3 mm in depth and nor more than 4mm distal to the palmar digital crease. Patients should be instructed to contact their physician in case of symptoms of tendon rupture. **Use in patients with coagulation disorders** - Xiapex must be used in caution in patients with coagulation disorders or those taking anticoagulants. Use of Xiapex in patients who have received anticoagulants (with the exception of up to 150mg acetylsalicylic acid daily) within 7 days prior to receiving an injection of Xiapex is not recommended. **Immunogenicity** - As with any non-human protein medicinal product, patients may develop antibodies to the therapeutic protein. Since the enzymes in Xiapex have some sequence homology with human matrix metalloproteinases (MMPs), anti-drug antibodies could theoretically interfere with human MMPs. No safety concerns related to the inhibition of endogenous MMPs have been observed, in particular no adverse events indicating the development or exacerbation of autoimmune diseases or the development of a musculoskeletal syndrome but the potential for it to occur cannot be excluded. If this syndrome were to develop, it would occur progressively and is characterized by one or more of the following signs and symptoms: arthralgia, myalgia, joint stiffness, stiffness of the shoulders, hand oedema, palmar fibrosis and thickening or

nodules forming in the tendons. **Long-term safety** - Long-term safety of Xiapex is not fully characterised. The impact of treatment with Xiapex on subsequent surgery, if needed, is not known. **Drug Interactions:** Use of Xiapex in patients who have received tetracycline antibiotics e.g. doxycycline, within 14 days prior to receiving an injection of Xiapex is not recommended. **Pregnancy & Lactation:** Not recommended in pregnancy. Xiapex can be used during breast feeding. **Driving and operating machinery:** Xiapex may have a major influence on the ability to drive and use machines due to swelling and pain in the treated hand. Other minor influences include dizziness, paraesthesia, hypoesthesia, and headache, see side effects. Patients must be instructed to avoid potentially hazardous tasks such as driving or using machines until it is safe to do so or as advised by the physician. **Side Effects:** In clinical trials, the most frequently reported adverse reactions during the Xiapex were local injection site reactions such as oedema peripheral (local to the injection site), contusion (including ecchymosis), injection site haemorrhage and injection site pain. Injection site reactions were very common, occurring in the vast majority of patients, were mostly mild to moderate in severity and generally subsided within 1-2 weeks post injection. Serious adverse reactions of tendon rupture, tendonitis, other ligament injury and complex regional pain syndrome related to the medicinal product were reported. Very commonly reported adverse reactions include lymphadenopathy, pruritus, ecchymosis, pain in extremity, oedema peripheral (including injection site oedema and oedema), injection site haemorrhage, injection site pain, injection site swelling, tenderness, contusion. Commonly reported adverse reactions include lymph node pain, paresthesia,

hypoesthesia, burning sensation, dizziness, headache, nausea, blood blister, blister, rash, erythema, hyperhidrosis, arthralgia, joint swelling, myalgia, axillary pain, inflammation, injection site inflammation, swelling, injection site erythema, injection site pruritus, injection site warmth, injection site vesicles, skin laceration. **Overdose:** Overdose is expected to be associated with increased local injection site reactions. Provide routine supportive care and treat symptomatically. **Legal Category:** POM. **Marketing authorisation holder:** Pfizer Ltd, Ramsgate Road, Sandwich, Kent, CT13 9NJ, UK. **Package quantities, Marketing Authorisation numbers and basic NHS price:** XIAPEX 0.9mg powder and solvent for solution for injection, EU/1/11/671/001, £650.00. **Further information is available on request from:** Medical Information at Pfizer Limited, Walton Oaks, Dorking Road, Tadworth, Surrey, KT20 7NS, UK. Tel: +44 (0) 1304 616161 Date of Preparation: February 2011. **Company reference:** XP1_1

Adverse events should be reported. Reporting forms and information can be found at www.yellowcard.gov.uk Adverse events should also be reported to Pfizer Medical Information on 01304 616161.

References:

- Gilpin D et al. *J Hand Surg Ann.* 2010;35:2027-2038.
- XIAPEX Summary of Product Characteristics. March 2011.
- Hurst LC et al. *N Engl J Med.* 2009;361:968-979.

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