

# BSSH

The British Society for  
Surgery of the Hand



## AUTUMN SCIENTIFIC MEETING

16-17 OCTOBER 2014

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND



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## PRESIDENT'S FOREWORD



**Richard Milner**  
**President**

Dear Members and Guests

The Autumn Scientific Meeting will once again be held at the Royal College of Surgeons in London. The second day of the meeting will be a combined meeting with the Irish Hand Surgery Society (IHSS). I am grateful for the many contributions of members of both societies including the IHSS President, Brid Crowley, that has resulted in this excellent programme.

The meeting has been organised with a practical theme and invites you to consider how we approach common problems, particularly those that do not always have a clear-cut solution. We will look in depth at the management of scaphoid fractures, hear the views of the experts and find out where there is consensus and where there is debate. I anticipate that this will be a topic in which there will be significant audience contribution to the panel discussion. On the second day we will consider nerve compression in the upper limb and this session will include live anatomical demonstrations. We will look at the common and not so common nerve compression syndromes and how we should approach their management and surgical release. There is a session on tips and tricks to consider when approaching selected problems in the hand and we will learn from the experts 'How to do it'. We have had a large number of excellent free papers covering the whole field of hand surgery. I am very grateful to those who have carefully evaluated the abstracts. The quality this year was high and selection was not an easy task. We have included parallel and bell sessions along with some excellent posters and this has maximised the number of submissions we have been able to accept. I am sure that you will find these presentations highly educational.

We have some excellent guest speakers including Ian Trail who will talk on the degenerative PIPJ and Mike Hayton on hand injuries in sportsmen. Kevin Herbert will give a thought-provoking lecture on comparative anatomy with a talk on the evolution of forelimb function.

The Society dinner on Thursday will be held at Sarastro restaurant in Covent Garden, a short walk from the College, and will feature a string quartet and live opera. Sarastro restaurant, named after a character in Mozart's 'Magic Flute', opened in August 1996. It is a rich tapestry of flamboyant artwork, gilt furniture and wall mounted opera boxes amongst which are numerous props and knick-knacks collected from nearby shows. The atmosphere is relaxed, yet highly charged and is a reflection of the ebullient founder who was passionate about food, wine and opera. For those who haven't been before I think that you will find it a very interesting experience, and one, which is completely OTT.

The meeting will cover many aspects of hand surgery with the presentations concentrating on the quality of the work we do and the increasingly important analysis of clinical outcome. It is an exciting programme in a familiar and relaxed setting, which will allow us to renew acquaintanceships and to meet new colleagues. This atmosphere I am sure will only enhance our enjoyment of the scientific programme.

# OUTLINE PROGRAMME

## THURSDAY 16 OCTOBER

- 08:15 Registration and refreshments  
08:40 Welcome - The President (Lecture Theatre 1)  
08:45 Free papers: Audit (Lecture Theatre 1)  
09:50 Lecture: What to do with the degenerative PIPJ (Lecture Theatre 1)  
10:00 Free papers: Miscellaneous (Lecture Theatre 1)  
11:10 Refreshments and trade exhibitions  
11:30 Lecture: Hand injuries in sportsmen (Lecture Theatre 1)  
12:00 Free papers: Nerve (Lecture Theatre 1)  
12:50 Audit database update (Lecture Theatre 1)  
13:10 Presentations and announcements (Lecture Theatre 1)  
13:20 Lunch and trade exhibitions / SWIFT Investigators' Meeting (Lecture Theatre 1)  
14:00 Symposium: Scaphoid fractures (Lecture Theatre 1)  
16:05 Refreshments and trade exhibitions  
16:30 Free papers: Hand trauma (Lecture Theatre 1)  
17:30 Annual General Meeting (open to Full Members and Associates only) (Lecture Theatre 1)  
19:30 (for 20:15) Society Dinner (Saraastro Restaurant, Covent Garden)

## FRIDAY 17 OCTOBER

- 08:30 Registration  
09:00 Keynote lecture: Nerve compression (Lecture Theatre 1)  
09:30 Anatomical demonstrations: Median nerve / ulnar nerve / radial nerve (Lecture Theatre 1)  
10:50 Rapid fire session (Lecture Theatre 1)  
11:25 Refreshments and trade exhibitions  
11:50 Symposium: How I do it (Lecture Theatre 1)  
12:50 Comparative anatomy – The evolution of the forelimb function (Lecture Theatre 1)  
13:20 Lunch and trade exhibitions
- |       | Lecture Theatre 1              | Lecture Theatre 2                |
|-------|--------------------------------|----------------------------------|
| 14:40 | Overseas services              | Free papers: Dupuytren's disease |
| 15:00 | Free papers: Wrist and forearm |                                  |
| 16:15 | Close of meeting               |                                  |

## GUEST SPEAKERS

### **Dr G A Buijze, MD PhD**

Orthopaedic Surgery Resident, Academic Medical Center, Amsterdam

Geert A. Buijze, MD, PhD is an Orthopaedic Surgery Resident at the Academic Medical Center in Amsterdam, the Netherlands. After obtaining his MD degree, he received the Toptalent Grant from the Netherlands Organisation for Scientific Research (NWO) for a PhD Research Fellowship at the Massachusetts General Hospital, Harvard Medical School in Boston. For his PhD-Thesis on Scaphoid Fractures he received Cum Laude. He remains ever passionate about combining innovative research and clinical practice.  
*Speaking in: Symposium: Scaphoid fractures – Thursday, 14:00*



### **Mr K Cronin, FRCSI FRCSI(Plast) EDHS MS**

Consultant Plastic Surgeon, Mater Misericordiae University Hospital and The Children's University Hospital, Dublin

Mr Cronin is currently the Honorary Treasurer of both the Irish Association of Plastic Surgeons and the Irish Hand Surgery Society. His special interests include all aspects of hand surgery, particularly congenital difference and nerve surgery.  
*Speaking in: Anatomical demonstrations – Friday, 09:30*



### **Professor J J Dias, FRCSEd**

Professor in Hand and Orthopaedic Surgery and Head of Section of Orthopaedic Surgery, University of Leicester

Professor Dias is the Professor in Hand and Orthopaedic Surgery and Head of Section of Orthopaedic Surgery at the University of Leicester and works at the University Hospitals of Leicester. His research interests are in epidemiology of hand disorders, Dupuytren's contracture, the outcome of interventions in upper limb and hand trauma and interventions for wrist disorders. He has focused on investigations of effectiveness of interventions for hand and upper limb disorders. He has published over 80 peer-reviewed articles and 25 chapters in books on hand surgery. Professor Dias has received a number of grants from societies and companies, including a grant from the BSSH for a national study on the outcome of Dupuytren's contracture surgery in 2006 and a £2.2 million grant from NIHR HTA 2013. He was Editor-in-Chief of the *Journal of Hand Surgery* (European) and a member of the Editorial Board for the *Journal of Bone and Joint Surgery*. Professor Dias was President of the British Society for Surgery of the Hand (BSSH) in 2008 and is Immediate Past President of the British Orthopaedic Association (BOA). He is a member of several hand and orthopaedic surgery societies internationally, including FESSH, IFSSH and the Indian Society for Surgery of the Hand. He was Head of School of Surgery at the East Midlands Healthcare Workforce Deanery (South).

*Speaking in: Scaphoid fractures – Thursday, 14:00*



### **Mr Nicholas Downing, FRCS(Orth)**

Consultant Orthopaedic Surgeon, Queens Medical Centre Nottingham

Nick Downing has been a Consultant Hand Surgeon at the Queen's Medical Centre, Nottingham since 2012. He trained in hand surgery in Nottingham, Derby and Sydney, Australia. He has a broad-based hand surgery practice with a particular interest in the management of distal radius and carpal bone injuries.

*Speaking in: Scaphoid fractures symposium – Thursday, 14:00*



**Mr A N M Fleming, MBChB FRCSEd FCS(SA)Plast**

Consultant Plastic Surgeon, St George's Hospital, London

Drew Fleming is a Zimbabwean by birth and upbringing. He completed MBBS at the University of Cape Town and Groote Schuur Hospital, South Africa. He then returned to Zimbabwe where he worked for nine years as a surgical trainee and ultimately Consultant General Surgeon, completing his FRCS(Edin) along the way. A desire to pursue his long-held interest in Hand Surgery took him back to Cape Town where he initially worked as a Trauma Unit surgeon before gaining a place in the Plastic Surgery training programme. After completing FCS(SA)Plast he undertook a Hand Fellowship under the tutelage of Robert Boome and Wikus De Jager. He then travelled to the UK in 1998 and spent a year at Great Ormond Street as a Fellow to Paul Smith then 6 months with David Evans at Windsor, Stanmore and St Thomas's (as a Pulvertaft Fellow). He was appointed as Consultant at St Georges in 2001 and his practice is predominantly Congenital Hands and complex adult hand reconstruction. He is also Divisional Chair of Surgery at St Georges, is an examiner for the Intercollegiate Board of Plastic Surgery and represented BSSH as Council member from 2009-2012.

*Speaking in: How I do it – Friday, 11:50*



**Mr Ian Grant, FRCS FRCS(Plast)**

Consultant Plastic Surgeon, Addenbrooke's Hospital, Cambridge

Ian Grant is a consultant plastic surgeon at Addenbrooke's Hospital Cambridge (the East of England Major Trauma Centre). He was educated at Oxford University, and was awarded a higher degree for research undertaken at the Blond McIndoe Centre at East Grinstead. He carried out fellowship training in hand surgery in Melbourne, Australia and St James' Hospital, Leeds. His work includes children's hand surgery and upper limb reconstruction. In addition to his roles in management and clinic practice, he teaches upper limb anatomy to Cambridge undergraduates.

*Speaking in: Keynote lecture: Nerve compression in the upper limb – Friday, 09:00hrs*



**Mr M J Hayton, FRCS(Tr&Orth) FFSEM**

Consultant Orthopaedic Hand Surgeon, Wrightington Hospital, Wigan

Mr Mike Hayton is a Consultant Orthopaedic Hand Surgeon. He works at Wrightington Hospital in the North West of England. Mike's clinical practice is exclusively hand, wrist and elbow surgery and he has a particular interest in sports injuries. He lectures widely in Europe and North America and has published many peer-reviewed articles and written several book chapters.

*Speaking in: Keynote lecture: Hand injuries in sportsmen – Thursday, 11:30hrs*



**Mrs Lisa Leonard BA MSc FRCS(T&O)**

Consultant Orthopaedic and Hand Surgeon

Mrs Leonard was born in Leicestershire and has lived in most areas of the country over the years. She trained at Cambridge University and then in Birmingham, Newcastle, Swindon, Bath, Oxford and Seattle. During her clinical training she was awarded a research fellowship from the Royal College of Surgeons allowing her to undertake a year of full time research culminating in the award of an MSc in Orthopaedic Engineering from Cardiff University. She obtained the Fellowship of the Royal College of Surgeons with a special interest in Orthopaedic and Trauma surgery in 2004 and then went on to

## GUEST SPEAKERS

further subspecialty training in Hand Surgery in Oxford and Trauma Surgery in Seattle. After 6 months as a locum Consultant in Reading she took up post in Brighton in July 2006. Her research and clinical interests include distal radius fractures, wrist replacement, scaphoid fracture surgery and wrist kinematics. Out of work she is married with 3 children and enjoys camping, running and cycling to try and keep fit.

*Speaking in: Symposium: Scaphoid fractures – Thursday, 14:00*



### **Mr S McHenry, MD FRCSI(Tr&Orth)**

**Consultant Hand & Orthopaedic Surgeon, Belfast Trust, Belfast**

Mr McHenry was appointed as a consultant in 2006 after training in orthopaedic surgery in Belfast and completing a hand fellowship at the University of California in San Francisco. His clinical interests include intra-articular PIP and elbow joint injuries. He provides expertise to Ireland's premier county senior hurling team.

*Speaking in: How I do it – Friday, 11:50*



### **Mr D J Shewring, MB BCh FRCSEd(Orth)**

**Consultant Hand Surgeon, University Hospital of Wales, Cardiff**

After training in orthopaedic surgery in Southampton, Cambridge and Cardiff and having completed a year of Interface Advanced Training in Hand Surgery in Oxford, David Shewring was appointed as a Consultant Hand Surgeon in Cardiff in 1994. After having served on various BSSH committees, as well as Council and the Organising Committee for the Instructional Courses, he was Honorary Secretary of BSSH between 2010 and 2012. He recently completed a term as Chairman of the Training Interface Group for Hand Surgery in 2014 and is co-author (with Vivien Lees) of the syllabus for Advanced Training in Hand Surgery, which is common to both T&O and Plastic Surgery curricula. He has presented regularly at BSSH meetings and has published numerous papers in the Journal of Hand Surgery, as well as several chapters in textbooks on hand surgery. He has been a member of the Editorial Board and remains an assessor for the Journal. He is currently the BSSH delegate to FESSH and IFSSH, working on bids to host these meetings. His clinical interests lie within the sphere of hand trauma and include the management of difficult hand fractures. Outside medicine, his interests include the cultivation of citrus, oenology and, now that he can't play anymore, watching his sons play rugby at Cardiff Arms Park!

*Speaking in: How I do it – Friday, 11:50hrs*

08:15 Registration and refreshments

08:40 Welcome –The President

### Free papers: Audit

Chairman: Miss J S Arrowsmith

08:45 Variation in clinical commissioning group guidelines for the treatment of carpal tunnel syndrome in England

Miss A Shaw, Mr W Mason, Mr A Khan, Miss H L Kerr, Dr S Graham (Gloucester)

**Introduction:** For patients with moderate carpal tunnel syndrome (CTS) in whom splinting is not effective, UK practice varies as to whether surgery or injection is recommended. However, the incidence of surgery is increasing, with consequent concerns over the funding available. Across England, Clinical Commissioning Groups (CCGs) are responsible for establishing guidelines for the management of common conditions such as CTS, in the primary care setting. There is a lack of good evidence on how to best manage patients with moderate CTS and the extent of variability in treatment practise is not well documented in the literature.

**Aims:** Our aim was to audit the CCG's policies nationally, to document their variability in assessment and treatment of CTS.

**Methods:** The management and referral guidelines for CTS in each CCG in England were identified via an online search or CCGs were contacted via email requesting the information. The data was collated and analysed for variation using Excel.

**Results:** Of the possible 214 CCG's, 178 responded (83%).

- All CCGs made a distinction between severe and moderate CTS
- No CCG distinguished mild from moderate CTS
- 22 (12%) require nerve conduction studies for referral to secondary care
- 59 (33%) required one or more steroid injections before referral to secondary care
- The duration of conservative treatment required before referral for surgery ranged from two weeks to more than six months, with 37 CCGs (20%) not specifying the duration at all

**Conclusion:** A wide variation exists in CCG policies for the treatment of CTS in England. We believe that if there was better evidence available to the commissioners that this would lead to standardisation of policies.

08:50 Discussion

08:52 British Society for Surgery of the Hand (BSSH): Are the waiting time guidelines for hand trauma achievable

Dr O Shastri, Mr H Twaij, Ms A Moon (Redditch)

**Introduction:** Hand injuries account for approximately 20% of Accident and Emergency attendances and hold a high personal and socio-economic cost. BSSH guidelines recommend that contaminated wounds are explored within hours and that digital nerve and flexor/extensor tendon lacerations are repaired within five days by surgeons with expertise in hand surgery. Waiting times to surgery should be minimised for optimal results.

**Aims:** The Alexandra Hospital, Redditch audited hand trauma waiting times in 2011. Following the appointment of a hand trauma coordinator and an additional hand surgery consultant, we aimed to re-audit patient waiting times to surgery and assess whether standards of care have improved.

**Methods:** Retrospective analysis of one hundred and sixty-one hand trauma theatre cases in 2014 at the Alexandra and Kidderminster Hospitals identified thirty-two cases of contaminated wounds, digital nerve or extensor/flexor tendon lacerations. Records were analysed for time to

surgery from admission and whether or not the operation was performed by a hand surgeon or under their direct supervision.

**Results:** Median time to surgery for contaminated wounds, extensor/flexor tendon and digital nerve lacerations was 5.7, 19 and 100 hours respectively, a 56% reduction from 2011. 88% (28/32) of patients were operated on within BSSH targets and 38% (12/32) of patients were operated on by a hand surgeon.

**Conclusions:** Since 2011, implementation of these standards at our hospital has significantly reduced surgical waiting time for hand trauma by more than half, saving on average two hospital bed days per patient with an associated cost of £15,717. We therefore recommend that following BSSH guidelines minimises morbidity and socio-economic cost as well as reducing hospital costs.

#### 08:57 Discussion

#### 08:59 Audit of hand injuries sustained during polytrauma

Mr R H Javaid, Miss R Thomas, Mr D Chester (Birmingham)

**Introduction and Aims:** Up to 25% of polytrauma patients have hand injuries. These patients are at high risk for delayed diagnosis of hand injuries. Our objective was to identify the load and pattern of hand injuries in polytrauma patients in a large trauma centre in UK and to elucidate the primary contributing factors for the delayed diagnosis of hand injuries.

**Material and Methods:** A six-month retrospective review of patients admitted under major trauma service (MTS) through A&E of Queen Elizabeth Hospital Birmingham was performed between January 2013 and June 2013. Patients' demographics, Glasgow Coma Score (GCS), Injury Severity Score (ISS), mechanism, injury type, length of stay, and timing of hand injury diagnosis were assessed.

**Key Results with Supporting Statistical Analysis:** Six hundred and eighty patients were identified, 33 (6.27%) meeting our inclusion criteria. They were aged nineteen to 83 years with a mean of 50+ 17.52. Only five (15%) patients were females. Seven (21.2%) had bilateral injuries. The most common injuries were closed fractures (34.8%) secondary to road traffic accidents. The most commonly fractured digit was the thumb (45%). Four (12%) patients had delayed diagnosis. Patients with delayed diagnosis had a higher ISS 28.5 (SD+12.3) versus 18.1 (SD+11.7) and length of hospitalisation: 42.8+28.0 days versus 14.7+15.8 days,  $p=0.0049$  (student t test). All four patients with delayed diagnosis had rib fractures with three (75%) of them also having concomitant vertebral column fractures.

**Conclusion:** Well-trained staff at a tertiary care trauma centre, following ATLS protocol, pick up most of the hand injuries. A focused tertiary survey is mandatory, particularly in patients who are intubated, with multiple injuries especially to the rib cage and vertebral column.

#### 09:04 Discussion

#### 09:06 Minimal important differences in elective hand surgery: A systematic review

Mr J N Rodrigues, Dr N Mabvuure, Mr D Nikkhah, Mr Z Shariff, Professor T R C Davis (Multi-Centre)

**Introduction:** Minimal important differences (MIDs) are the smallest improvements from treatment that are relevant to patients. They are important when studying clinical outcome data, and for estimating sample sizes in trial design. MIDs vary between conditions, treatments and follow-up length, and can be calculated in different ways.

**Methods:** The review methodology was based on the PRISMA statement. Medline, Embase and AMED were searched in parallel, and the online first section of the Journal of Hand Surgery was

manually searched. Articles describing the generation of MID estimates for elective hand surgery were included and data extracted.

**Results:** Ninety-nine MIDs were identified in 29 articles. The conditions, treatments, outcome measures and follow-up lengths are discussed. Thirty-two out of 99 MIDs were calculated in cohorts of mixed conditions. Thirty-nine different outcome measures had at least one MID. The Disabilities of the Arm, Shoulder and Hand (DASH) had the most MIDs (15 in total), which varied from 3.9/100 to 15/100 depending on the clinical condition, treatment and follow-up length studied. The methods used to estimate MIDs also varied between studies. Most MIDs were calculated using retrospective anchors that split outcomes into 'better' or 'stable'/'worse'. Future research directions in this area are suggested, as many conditions do not have MIDs available. Given the variation in MIDs seen between different situations, extrapolation of MIDs to such other conditions/treatments may not be appropriate.

**Conclusions:** A range of MIDs already exists for use in elective hand surgery. These vary depending on the clinical context, and specific MIDs should be used when discussing clinical outcomes. Further study of meaningful clinical outcome is required.

#### 09:11 Discussion

#### 09:13 The 'Chicken Hand' - A training model for hand surgery

Miss S Yao, Mr A Iqbal, Mr D Bell (Liverpool)

**Background:** In the current training climate, operative experience is significantly time limited. To reduce patient risk and improve outcome, training simulations are becoming increasingly popular. These simulators rely on their likeness to reality and cost effectiveness to gain popularity. Although there are well-trusted training bone substitutes, these are expensive and tend not to respond in the same way as actual bone. We have designed a low cost simulation model that uses chicken bone to better represent metacarpals for use in hand fracture teaching courses.

**Methods:** Chicken thighbones were used to simulate metacarpals, with plastic piping to represent soft-tissue spacers, and galvanised wire to articulate the individual bones. Transparent silicone sealant was used to cover the bones and represent periosteum. The 'Chicken Hand' models were used as part of a regional plastic surgery trainee hand teaching day and validated through a feedback survey of eleven trainees.

**Results:** Candidates were asked to score the "Chicken Hand" for individual elements including ease of inserting screws, similarity of drilling into real metacarpal, the silicone periosteum, similarity to metacarpal shape and size, and overall use as a training simulator. The overall average score was 3.22 out of a maximum of 4. Trainees felt the "Chicken Hand" was similar, better or much better in comparison to existing plaster/foam teaching models.

**Conclusion:** The "Chicken Hand" is a good simulation model with estimated cost savings in the region of £450 for a similar sized course, when compared with the leading bone substitute teaching product.

#### 09:18 Discussion

#### 09:20 Fanconi anaemia: Examining guidelines for testing all patients with radial ray dysplasia or thumb anomalies

Mr A G Barabas, Dr C Wallner, Ms G Smith (London)

**Introduction:** The current UK guidelines suggest that every child with radial ray dysplasia or a thumb anomaly should undergo further genetic testing for Fanconi anaemia.

**Methods:** This study reviews the numbers of patients and referral patterns, as well as the financial and service provision implications of these newly introduced guidelines on the congenital hand service at Great Ormond Street Hospital. Between January 1st 2009 and January 1st 2012 all

195 new patients with a radial ray or thumb anomalies seen by the congenital hand service were included in this study.

**Conclusion:** We have shown no significant correlation between hand-related abnormalities and Fanconi positive test results. None of the positive Fanconi anaemia patients in this study had an isolated upper limb anomaly in the absence of other features of Fanconi anaemia. As conclusion this study does not support Fanconi anaemia testing for isolated thumb anomalies in the absence of other features of Fanconi anaemia.

#### 09:25 Discussion

#### 09:27 Carpal tunnel decompression in patients with bleeding disorders

Dr J Littlechild, Mr T Finnigan, Professor C Hay, Mr S Shah, Mr J Gregory (Manchester)

**Introduction:** Carpal tunnel syndrome is a common entrapment neuropathy. The peri-operative management of patients with bleeding disorders can be challenging. The outcome of these patients undergoing carpal tunnel decompression (CTD) has not previously been reported. We wished to examine if there was an increased complication rate in this patient group.

**Method:** Case notes of patients with bleeding disorders who underwent CTD were reviewed and analysed for demographic details, type of bleeding disorder, orthopaedic and haematological haemostasis interventions and post-operative complications.

**Results:** Fifteen CTDs were performed on nine patients with documented bleeding disorders (four haemophilia, two von Willebrand disease, two factor XI deficiency and one platelet storage pool disorder). There were three males and six females with a median age of 51 (range 39-69). The median operation duration was twenty minutes (range 13-20 minutes) and the median length of stay was two days (range 0-6 days). Pre-operative desmopressin (DDAVP) was given in four (27%) patients and Haemate P (von Willebrand Factor and Factor VIII) was given in 11 (73%) patients. No intra-operative bleeding problems occurred. Post-operatively all patients recovered in the same manner as patients without bleeding disorders and specifically there were no haematomas or return to theatre. One patient required revision decompression six months later due to persistent symptoms.

**Conclusion:** This is the first case series depicting CTD in patients with bleeding disorders. CTD is a safe treatment with low complication rates in this complex patient group. It requires a multi-disciplinary approach and significant increases in patient care.

#### 09:32 Discussion

#### 09:34 Hand surgery in the British press

Mr O Bassett, Miss J Ruston, Miss P Chadha, Miss H Lloyd-Hughes, Miss B Jemec, (London)

**Introduction:** Despite declining sales daily newspapers still possess a significant readership, especially if online content is taken into account. They therefore play an important role in public education. The aim of this study was to evaluate the reporting of hand surgery in the mainstream British print press.

**Methods:** A search of the LexisNexis® newspaper database was performed for the ten-year period from 1st January 1986 to the 1st June 2014. The top ten UK newspapers by circulation were included. The search terms used were: hand surgery; hand surgeon; British Society for Surgery of the Hand (BSSH) and Journal of Hand Surgery.

**Results:** Five hundred and twenty-six articles were reviewed. Articles were categories by their main theme into trauma, arthritis, tendon, nerve, replantation, transplant, tumour, sports injury, congenital or other. If a consultant surgeon was quoted, the BSSH membership database was searched for their name, and it was noted whether BSSH was mentioned in the article. The most

common theme was sports injuries, however, all areas of the hand surgery were included with particular recent interest in hand transplantation. There were sixteen references to the BSSH, of which half were in obituary articles.

**Conclusions:** Hand surgery articles are fairly common within British newspapers, covering a variety of topics. Hand surgeons, with the support of BSSH, could do more to promote the specialty and the Society's work within the British print press.

**09:39 Discussion**

**09:41 Is the UK ready for hand transplantation?**

Dr I Ali, Dr M Nassimzadeh (Birmingham)

**Aim:** With the advent of hand transplantation in the UK, what was once laboratory-based theory is now a clinical reality. The aim of this paper is to examine attitudes towards hand transplantation in the general public as well as tomorrow's clinicians: medical students.

**Methods:** A survey regarding organ transplantation and hand transplantation was distributed through the University of Birmingham Medical School and the general public, which identified their demographic data and opinion on solid organ transplantation. Respondents' knowledge of hand transplantation, their perceptions of its benefits, the level of risk they would be willing to take (in life years sacrificed) to have the operation, and indications for hand transplantation.

**Results:** A total of two hundred medical students and 200 members of the public were interviewed. Among the general public opinions were divided as follows: 63% in favour, 21% against and 17% undecided, whilst medical students were 80% in favour, 5% against and 15% undecided. In exchange for a hand transplant, 19% of medical students were willing to forgo eleven or more years of their life, compared to only 3% of the general public.

**Conclusion:** This survey suggests that there is support for hand transplantation both among the general public and medical students. However, knowledge on the subject is limited and this is a barrier to potential donation if hand transplantation becomes a clinical reality rather than an experimental exercise.

**09:46 Discussion**

**Keynote lecture**

Chairman: Mr R H Milner

**09:50 What to do with the degenerative PIPJ**

Professor I A Trail

**Free papers: Miscellaneous**

Chairmen: Mr S L Knight, Miss M E Birks

**10:20 Congenital constriction ring syndrome: Observations, surgical approach and optimisation of treatment**

Miss L Ng, Miss S Stevenson, Miss B Crowley (Newcastle upon Tyne)

**Background:** Constriction ring syndrome (CRS) is a congenital condition with an incidence of 1:2000 to 1:15,000 in live births. Upper limbs and distal extremities are most frequently affected. Patterson classified these deformities into simple ring constrictions, constrictions with distal deformity (+/-lymphoedema), constrictions accompanied by fusion of distal parts. We report our experience in managing this complex condition.

**Method:** A retrospective review of children with CRS referred to a specialist centre was performed. Patient demographics, anatomy of constriction, Patterson classification, management and outcome were recorded.

**Results:** Twenty-three patients were studied. (M:F ratio 11:12). Five were born prematurely, five had other congenital anomalies and nine had lower limb involvement. Thirteen patients had bilateral hand involvement. In the upper limb, five were classified as Patterson Type I, two as Type II, 14 as Type III and ten as Type IV. Eleven patients had surgery and nine underwent multiple staged operations. Procedures included digital separation, release of acrosyndactyly, excision of constriction rings and debulking of lymphoedema. Two cases required urgent surgery: (1) constriction ring excision, longitudinal fasciotomies and neurolysis on the upper limb in a premature infant with a high median and ulnar nerve palsy, (2) excision of distal lymphoedema of the hand. Functional and aesthetic improvements were observed in most patients.

**Discussion:** Specific aspects of our treatment approach include optimisation of skin condition at each stage of treatment and excision of constriction rings on limbs without z-plasty using longitudinal fasciotomies. Appropriately timed staged surgical intervention maximises function in these complex patients.

#### 10:25 Discussion

#### 10:27 Triphalangeal thumb - A diverse phenomenon

Ms E K Reay, Miss L Ng, Ms S Stevenson, Miss B Crowley (Newcastle upon Tyne)

**Background:** Triphalangeal thumb is an uncommon phenomenon. By definition a thumb with three phalanges, this basic definition belies the great diversity of clinical presentation. The triphalangeal thumb spectrum includes patients with fully functioning hands with five digits and an opposable thumb, radial polydactyly, hypoplastic thumb and the three-digit hand. We present our experience and evolution of practice in treating this condition.

**Method:** A retrospective study of eighteen patients presenting with 27 triphalangeal thumbs was performed. Clinical, photographic, radiological and detailed anatomical operation records were reviewed.

**Results:** A wide range of clinical presentations was observed. Five-digit opposable hands (eight thumbs), radial polydactyly (14 thumbs), three-digit hands (three thumbs) and hypoplastic (two thumbs). Median age at presentation was two years (range eight weeks to 14 years). Twenty-three thumbs underwent surgery. Skeletal procedures included joint excision and fusion, excision of additional phalanges, osteotomies and first metacarpal shortening. Soft tissue surgery included first web deepening and procedures to address anomalous tendon and muscle anatomy. We observed more complex patterns of anatomical anomalies in the radial polydactyly cohort. Choice of procedure was guided by mobility and stability of joints, length and longitudinal alignment of thumb/first metacarpal, opposition potential, musculotendinous units and skin. Variability between thumbs was observed in all bilateral cases.

**Conclusion:** We advocate detailed anatomical exploration of these complex anomalies at the time of primary surgery. This guides primary treatment and has a useful prognostic role. We favour lateral incisions which offer excellent access and cosmesis.

#### 10:32 Discussion

#### 10:34 Experience of bleomycin sclerotherapy treatment of upper limb vascular malformations

Mr J Wokes, Mr T Muir, Dr G Kessell (Middlesbrough)

**Introduction:** Treatment of vascular anomalies of the upper limb, especially lymphatic and venous malformations, remains challenging. Surgical excision risks damage to vital structures and can disappointingly be followed by recurrence. We have utilised bleomycin sclerotherapy successfully in both microcystic lymphatic and complex venous malformations with no neural injury and minimal recurrence. Bleomycin acts as a highly selective sclerosant with minimal tissue reaction.

**Methods:** Data is collected as a prospective observational study. Colour photographs are taken before and after treatment. Injection is performed percutaneously with ultrasound guidance under a short general anaesthetic or Remifentanyl sedation as a day case procedure.

**Results:** Forty-five patients received treatment: 30 females and 15 males with an age range of 0–79 years and median of 26.5 years. Thirty-nine venous malformations, three haemangiomas, two lymphatic malformations and one other vascular malformation were treated with a 100% response rate. 66.7% of patients achieved complete resolution, 26.6% significant improvement and 6.7% presented with mild to moderate improvement. Eighty patients were referred from other centres in the UK. 47% of patients with previous unsuccessful treatments performed elsewhere were salvaged successfully. An average dose of 0.335 mg/kg was used in an average of 4.2 sessions. Minimal complications occurred: swelling and bruising  $n=4$  (2.2%), skin pigmentation  $n=1$  (0.56%), ulceration  $n=1$  (0.56%), nausea and vomiting  $n=1$  (0.56%) and infection  $n=1$  (0.56%). No patient presented with lung complications. After six years, a recurrence occurred in only two patients (0.57%).

**Conclusions:** A high success rate, very low recurrence and minimal complication rate makes bleomycin a powerful and attractive non-surgical treatment choice for upper limb vascular anomalies.

#### 10:39 Discussion

#### 10:41 Evaluation of surgical strategies for arterial repair in fingertip replantation

Dr T Kasai, Dr H Manabe, Dr M Takahashi, Dr J Iwase, Dr T Mitsuhashi (Takamatsu, Kagawa, Japan)

**Background:** The overall incidence of upper limb replantation in Japan has been annually decreasing and, in particular, replantation proximal to the hand is becoming extremely rare. However, the total number of patients undergoing fingertip replantation remained unchanged in recent years, and with a relative increase in the percentage of such patients, the need for fingertip replantation surgery is also rising. Fingertip replantation differs from other amputation levels. In addition, because of associated problems, such as vessels being either too narrow or insufficiently long as a result of bone shortening, anastomosis is not possible. Fingertips also have specific anatomical features, in which the blood vessels split into peripheral branches directly from the arterial arches. Therefore the arterial repair method must be carefully chosen. Here we present arterial repair methods for fingertip replantation we performed and our classification of these methods according to the state of vascular injury.

**Patients and Methods:** We evaluated a total of twenty-three patients (23 fingers, Male 21; Female 2; mean age 46 years; range 2–79 years) who underwent fingertip replantation during a ten-year period (1999–2009). All subjects were broadly classified before surgery with either type I injuries, in which the distal transverse palm arterial arch (hereinafter DTPA) was intact, or type II, in which the DTPA was missing. Subjects were then sub-classified as either type IA, in which the DTPA was proximal, or type IB, in which the DTPA was distal to the amputation stump. The arterial repair method for each type of arterial injury was then examined after surgery.

**Results:** The overall graft survival rate was 91.3%. Among the repair methods according to the type of arterial injury, end-to-end anastomosis between the transpositioned arterial arch and central pulp artery (hereinafter CPA) was feasible in 75% of type IA patients in whom the DTPA was intact. Among those with type IB injuries, end-to-end anastomosis between the end of the peripheral arterial arch and proper digital artery (hereinafter PDA) was feasible in 80% of patients. Among those with type II injuries, a vein graft was necessary between the CPA and PDA in 92% of patients in whom the DTPA was missing.

**Conclusions:** In fingertip replantation, the arterial repair method was pre-operatively determined according to whether or not the DTPA was intact and its site to enable early determination of the need for vein harvesting and appropriate anastomotic site.

## 10:46 Discussion

## 10:48 Mid-term functional outcomes of the entire upper limb replantation

Dr H Manabe, Dr T Kasai, Dr M Takahashi, Dr J Iwase, Dr T Mitsuhashi (Takamatsu, Kagawa, Japan)

**Background:** The overall incidence of upper limb replantation is annually decreasing and, in particular, replantation proximal to the hand is becoming rare. Surgical techniques and post-operative care differs according to each level of upper limb amputation, however, the final clinical outcomes are not always favourable.

**Purpose:** We report the mid-term clinical outcomes of the entire upper limb replantation and associated issues that we encountered.

**Patients and Methods:** We evaluated a total of fifty-seven patients (male 54; female three; mean age 42 years; range two – 79 years) who underwent upper limb replantation during a ten-year period (1999–2009) and whose follow-up was possible for  $\geq 2.5$  years (mean follow-up period five years). Replantation proximal to the hand (proximal amputation) was performed in twelve patients (for the upper arm four; forearm four; and hand four). Finger replantation (distal amputation including zone V according to the Tamai classification) was performed in forty-five patients (48 fingers). Fingertip replantations corresponding to zones I and II in the Tamai classification were performed in twenty-three patients.

**Results:** The overall survival rate was 85.5%. When examined according to the amputation site, the survival rate was 90% for proximal replantations, 84.4% for finger replantations, and 91.3% for fingertip replantations. The survival rates for zones III–V according to the Tamai classification were relatively poor compared with those for other zones in the finger. A post-operative functional evaluation of proximal replantation sites (Chen criteria) revealed that 66.7% were grade II (good) and 33.3% were grade III (fair). A post-operative functional evaluation of finger replantation (Tamai Evaluation Score) found that 70.3% were excellent, 21.6% were good and 8.1% were fair. Functional outcomes were good for more peripherally located finger replantation compared with those for proximal replantation.

**Conclusions:** Post-operative outcomes of upper arm and proximal forearm replantations were influenced by the revascularisation time, while taking into account the limit for warm ischemia time of the muscles. Among proximal replantations, muscle transfers were performed in some patients to restore muscle power. It was necessary to consider early mobilisation of metacarpophalangeal and proximal interphalangeal joints while performing surgery to achieve good outcomes for finger replantation in zones III–V of the Tamai classification system. For fingertip replantations, in addition to clinical outcomes, patient satisfaction was also high leading us to conclude that a fingertip replant was effective.

## 10:53 Discussion

## 10:55 Flexor sheath infections: A review of presentation and management in a tertiary centre

Mr G Murphy, Miss L Cooper, Ms M Anadkat, Mr B Sivakumar (London)

**Introduction and Aims:** Flexor sheath infections are a surgical emergency, requiring intravenous antibiotics and surgical exploration to avoid tendon liquefaction and a poor functional outcome. The aim of this study was to retrospectively review the presentation, management and functional outcome of all patients surgically managed for a flexor sheath infection at one tertiary centre over four years.

**Materials and Methods:** Sixty-two patients and 65 flexor sheath infections were included in the study. Surgical and hand therapy notes were retrospectively reviewed for demographic data, clinical findings, surgical approach and functional outcomes. Biochemical results were included from the hospital pathology system. Statistical analysis compared outcomes with an open or closed surgical approach, smoking status and completion of hand therapy using an unpaired, two tailed, students' t-test ( $p < 0.05$  taken as significant).

**Results:** There were thirty-five men and 27 women with a median patient age of 46 years presenting at a median of three days from insult or onset of symptoms (interquartile range 2-5.5). The majority followed a penetrating wound ( $n=30$ , 63%), though animal/human bites, hand infections and spontaneous incidences were all represented. The median time from plastic surgical review to onset of anaesthesia was five hours 30 minutes ( $n=31$ , IQR 3h10 – 10h29). Inflammatory markers were raised in thirty-eight patients at presentation. Forty-two had frank pus in the sheath on exploration. Thirty-seven had a closed and 28 an open approach during surgery, with a median of one (IQR 0-2) further operation. Seven patients underwent terminalisation, six within a month and one a year later. Complications included: one rupture, 12 contractures, 31 adhesions and seven infections. The median length of hand therapy was six weeks (IQR 2.1-12.8 weeks), with six (IQR 3-9) sessions. Twenty-six patients did not complete hand therapy. Of those who did, twenty-seven returned to normal activities, two did not and the rest were not documented. Using the Original Strickland criteria, 18 (34%) patients had excellent, 12 (22%) good, 16 (29%) fair and nine (16%) poor outcomes. Two patients were transferred, three terminalised to P1 and five did not attend after their first appointment. There was no significant difference in outcome between a closed and open approach to surgery ( $p=0.61$ ) or between smokers and non-smokers ( $p=0.66$ ). There was a significantly better outcome with the completion of hand therapy ( $p=0.04$ ).

**Conclusion:** The presentation of flexor tendon sheath infections and important aspects of management are discussed.

#### 11:00 Discussion

#### 11:02 Use of bridge plating in complex trauma of the hand and the wrist

Mr P Mikalef, Mr M Gupta, Mr D Power, Mr S Tan (Birmingham)

**Introduction:** Comminuted intra-articular fractures in the hand present a difficult challenge for the surgeon. Conventional methods of treatment are associated with significant risks and complications. Ligamentotaxis with external fixator devices have shown reasonable results in fracture fragment re-alignment. However, pin-track infections and compliance remain an ongoing problem. We present our results of treating these complex injuries using the technique of internal bridge plating.

**Methods:** We reviewed the results of fifteen patients who underwent this procedure at the Birmingham Hand Centre. We will discuss their demographic profiles and their fracture patterns. The injuries involved comminuted intra-articular fractures of the following joints:

1. Proximal interphalangeal joints (2 patients)
2. Metacarpo-phalangeal joints (1 patient)
3. Carpo-metacarpal joints (9 patients)
4. Radio-carpal joints (3 patients)

The fractures were re-aligned using the principles of ligamentotaxis, and the joints were bridged using internal fixation with plates. The metalwork was removed after fracture healing when the involved joints were mobilised. Aggressive therapy was instituted. Results were analysed for fracture healing and joint range of movement. Deformities and complications were noted.

**Results:** All fractures healed with good alignment. The group of patients where the plates were removed, was found to have recovered a functional range of movement in the affected joints. Three patients chose not to have the metalwork removed. They had fractures involving carpo-metacarpal joints of the fingers and had recovered good function in the hand. One patient needed secondary reconstruction for a composite tissue defect after a circular saw injury. No significant complications were noted in any patients.

**Conclusion:** Comminuted intra-articular fractures in the hand are a challenging problem. Bridge plating is a good alternative. Patient compliance is very good. Stiffness and deformity are minimal. We feel that this is a useful skill in the armoury of the hand surgeon treating these difficult injuries

11:07 Discussion

11:10 Refreshments and trade exhibition

## Keynote lecture

Chairman: Mr R H Milner

11:30 Hand injuries in sportsmen

Mr M J Hayton

## Free papers: Nerve

Chairmen: Mr I S H McNab, Miss G Bourke

12:00 Incidence and shoulder outcome of unilateral obstetric brachial plexus injury in the Scottish population

Mr A McKean, Mr M Gorman, Mr T Hems, Professor A Hart (Glasgow)

**Introduction and Aims:** It is to the detriment of patient and parental counselling and support, and to the pursuit of adequate, equitable service level NHS funding that the current incidence, surgical requirement, and outcome of obstetric brachial plexus injury (OBPI) remains inadequately defined at the population level. This study sought to report that data by statistical investigation of the Scottish National Brachial Plexus Service Database.

**Material and Methods:** The Service prospectively records relevant musculoskeletal and plexus injury outcomes. Records for patients presenting from March 2002 to June 2013 ( $n=373$ ) were screened ( $n=127$ ) excluded due to inadequate data/incorrect diagnosis and retrospectively assessed ( $n=246$ ). Birth incidence was estimated, and outcomes were interrogated relative to Narakas grade/age at recovery of biceps function (SPSS).

**Results:** OBPI affected  $>0.4$  per 1000 live births; 30% were discharged by age one, indicating spontaneous recovery (none represented); 70% did not recover. Primary surgical intervention was performed in 26% of cases ( $n=13$  nerve exploration,  $n=52$  shoulder surgery; indications evolved). Nerve surgery (5%) was performed at a mean 5.8 months old ( $SD=2.4$ ); further procedures were required in 38% ( $n=5$ ) of this group. Of patients not undergoing nerve surgery 21% required surgery. Narakas Grade and age at recovery of biceps were confirmed as prognostic indices for future Mallet scores. The time course of shoulder recovery is described.

**Conclusion(s):** Few units have captured longitudinal data for such large numbers of patients into adolescence. The long-term shoulder outcomes in patients undergoing nerve surgery were encouraging. Nerve surgery was of benefit in severe cases.

12:05 Discussion

12:07 Combined transfer of the medial triceps branch to the infraspinatus branch of the suprascapular nerve and the axillary nerve and use of cutaneous branch to reinnervate infraspinatus: First case to use the cutaneous nerve as a conduit

Mr M Nassimzadeh, Mr A Misra, Mr D Power (Birmingham)

Complete injury to the C5/6 roots of the brachial plexus results in loss of shoulder abduction, shoulder external rotation and elbow flexion. The results of nerve grafting of upper trunk ruptures are variable due to post-traumatic axonal loss, axonal misdirection and long reinnervation times. Nerve transfer surgery provides reliable restoration of shoulder abduction and elbow flexion in upper (C5/6) brachial plexus injuries. The restoration of shoulder external rotation is less predictable

Power *et al* previously explored the option of separate targeted reinnervation of the infraspinatus branch of the suprascapular nerve through a direct nerve transfer from the medial triceps branch of the radial nerve. The original description of radial to axillary nerve transfer used a long head

of triceps branch and the nerve was coapted directly to the anterior division of the axillary nerve after mobilisation. A modified approach using the medial triceps branch to the main trunk of the axillary nerve has been described.

This paper describes a further modification of this technique which provides further improvement to external rotation. This is achieved by medial tricep branches transfer to the main axillary nerve to reinervate both deltoid and teres minor however motor axons may be 'lost' down the cutaneous branch. We have successfully rerouted this branch to the infraspinatus and present the first clinical case to use this technique. The patient demonstrated full shoulder abduction and external rotation.

This new technique improves on our previous one by using what was previously thought of as an unwanted effect of transferring to the axillary nerve, which is motor axons 'loss' down the cutaneous branch to further improve our clinical outcomes.

**12:12 Discussion**

**12:14 Partial phrenic nerve neurotisation for idiopathic spinal accessory nerve palsy**  
Mr J Woods, Ms A Collins, Mr D Hynes, Mr K Cronin (Dublin)

Idiopathic spinal accessory nerve palsy is rare and typically results in dysfunction of the trapezius muscle with consequent implications for shoulder movement and stability. Nerve transfer surgery offers an opportunity for treatment, with several options for donor nerves. We report the novel use of a partial phrenic nerve transfer to the spinal accessory nerve twenty-two months after the onset of symptoms of an idiopathic palsy. Post-operatively, there was a significant improvement in shoulder performance without compromise to respiratory function at fifteen months of follow-up.

**12:19 Discussion**

**12:21 Permanent neuropathy caused by brachial neuritis**  
Miss J Dorairaj, Mr K Cronin (Dublin)

Brachial neuritis is reported as a self-limiting clinical condition characterised by acute, severe shoulder pain followed by patchy paresis in the upper limb. We present a case series of twelve patients who presented with brachial neuritis over a five-year period with subsequent permanent neuropathy. Clinical notes were reviewed in addition to a questionnaire measuring changes in pain scores and upper limb functionality.

Eight were male and four female, with an average age of 39 years at onset of symptoms. Six cases were idiopathic, four post-traumatic, one post-surgery and one post-radiotherapy. Six patients experienced widespread upper limb neuropathy and six had isolated single nerve pathology. Four of the 12 patients did not require surgical intervention. Of the eight requiring surgical exploration, four nerve transfers, three nerve decompressions and one secondary brachial plexus surgery were performed. Two nerve transfers who were twelve months post-surgery were both successful. One of the three patients who had nerve decompression demonstrated objective improvement in motor function. The questionnaire response rate was 67% (8/12) with an average follow-up period of 27 months and average reduction of 63% of the visual analogue score from symptom onset. Seventy-five percent of respondents recorded an arm grade of 2 on the Overall Disability Sum Score, reflective of a moderate level of disability at a minimum of 15 months post-neuritis. Chronic pain was an ongoing issue in four patients.

As demonstrated in our case series, it is not uncommon that patients experience permanent motor neuropathy in addition to chronic pain post brachial neuritis.

**12:26 Discussion**

**12:28 Functional outcome of single event multilevel upper limb surgery for hemiplegic cerebral palsy in young adults**

Mr H Nagata, Miss F Bintcliffe, Mr J Berstock, Mr G Atherton, Mr R Bhatia (Bristol)

**Introduction:** There is limited evidence in the literature of outcome measures following bone and soft tissue reconstructive surgery to the upper limb in cerebral palsy. We report the outcome of single-event multilevel surgery in young adults.

**Methods:** We present a prospective case series of nine young adults with hemiplegic cerebral palsy. All patients underwent multilevel upper limb surgery in a single event between 2010 and 2012. They had videotaped analysis pre and post-operatively using the validated Shriners Hospital for Children Upper Extremity Evaluation (SHUEE). Spontaneous function, dynamic position and grasp release ability were analysed to assess outcome of surgery.

**Results:** Nine patients (six male and three female) with a mean age at time of surgery of 17 years (15-21) underwent a combination of soft tissue (muscle release and tendon transfer) and bony procedures (fusion). Follow-up SHUEE scores were taken at a mean of eleven months (1-26) post-operatively. The average improvement in spontaneous function was 13.1% (-18-45), dynamic positional analysis of 11.2% (-8-39) and grasp and release of 27.8% (0-83). All patients indicated that they would have the surgery again.

**Conclusion:** All but one patient showed improved spontaneous use, dynamic segmental positioning and grasp release ability following their single-event multilevel surgery. The SHUEE is a useful tool to guide and evaluate surgical interventions in adolescents with upper limb hemiplegia.

**12:33 Discussion**

**12:35 Synovial cell sarcoma mimicking a Schwannoma of the median nerve**

Mr A Mishra, Mr S Chan, Mr R Tillman, Mr M Waldram (Birmingham)

Intraneural synovial sarcomas of peripheral nerves are rare and have been sporadically reported in the literature. We report the rare presentation of a synovial sarcoma of the median nerve mimicking a Schwannoma and discuss the controversies surrounding the treatment and management of these lesions.

A forty-six year-old male originally presented with a two-year history of right wrist swelling and pain. His symptoms were partially relieved after two steroid injections administered by his GP. He underwent carpal tunnel decompression at his local unit but his symptoms did not improve. MRI revealed a tumour of the median nerve and he was subsequently referred to the bone tumour unit. The lesion was consistent with a benign Schwannoma and after discussion at a multidisciplinary team (MDT) meeting the patient was listed for excision of the lesion. Intra-operatively it did shell out as a Schwannoma but histopathology revealed it to be a synovial cell sarcoma. The patient is undergoing radiotherapy post-operatively following discussion in an MDT.

The principles of treatment of these synovial sarcomas include wide or radical excision due to the risk of recurrence and/or adjuvant and neoadjuvant radiotherapy, although this remains controversial. Due to the site and location, the treatment options are complex and are outlined below.

We highlight the problems faced when dealing with an unusual diagnosis intra-operatively and the appropriate management algorithm. We discuss the treatment dilemmas with regard to this rare condition including amputation, excision of the median nerve with nerve grafting and radiotherapy and radiotherapy alone.

**12:40 Discussion**

**12:42 Reconstruction of shoulder contour following forequarter amputation using free osteomyocutaneous fillet flaps**

Mr Z Hassan, Mr D Wilks, Miss D Bhasker, Mr I Smith, Professor S Kay (Leeds)

**Background:** Despite increasing application of limb preservation surgery in the management of sarcoma, forequarter amputation remains indicated in proximal high grade bone sarcomas and those that are recurrent, radiation induced or involve the brachial plexus. Forequarter amputation is a devastating procedure for the patient, both aesthetically and functionally. It produces a displeasing shoulder profile, limits clothing choices and does not permit the application of functional prostheses. Reconstruction using an osteomyocutaneous free fillet flap from the amputated limb potentially reduces its functional and social impact. We describe our experience with this reconstruction, its technical application and outcomes.

**Method:** All forequarter amputations reconstructed with osteomyocutaneous free fillet flaps between 2009 and 2013 in a single tertiary referral centre were reviewed.

**Results:** Four forequarter amputations were performed by the senior author (SPK). Three microsurgical osteomyocutaneous fillet flap reconstructions were performed. One reconstruction was contraindicated by an unextractable humeral endoprosthesis. All flaps were successful. Mean additional operating time was 77 minutes. Shoulder profile was restored in all cases. Additional procedures included one removal of plate and two skin flap revisions. An upper limb prosthesis was successfully applied in one case. Two patients chose not to use a prosthesis. Large, post-amputation, cutaneous defects are readily reconstructed using this technique.

**Conclusion:** Free osteomyocutaneous fillet flap reconstruction is a valuable adjunct to forequarter amputation, requiring no more than 90 minutes of additional time and offering considerable benefits.

**12:47 Discussion**

**12:50 Audit Database Update**

Miss S M Fullilove

**13:10 Presentations and announcements**

**13:20 SWIFT Investigators' Meeting**

**13:20 Lunch and trade exhibition**

**Symposium: Scaphoid fractures**

Chairman: Mr M A C Craigen

**14:00 The anatomy of the scaphoid**

Dr G Buijze

**14:15 The scaphoid fracture that isn't one**

Mr P R Stuart

**14:30 Undisplaced and proximal pole fractures of the scaphoid**

Mrs L Leonard

**14:50 Displaced scaphoid fractures**

Mr N D Downing

15:10 **Displaced scaphoid fractures – concepts and dilemmas**  
Dr G Buijze

15:30 **Asymptomatic non-unions**  
Professor J J Dias

15:50 **Panel discussion**

16:05 **Refreshments and trade exhibition**

## **Free papers: Hand trauma**

Chairmen: Mr D J Brown, Mr D P Newington

16:30 **Nail bed INJuries Analysis trial (NINJA): Results of national survey of nail bed repair practice**  
Mr M Gardiner, Mr A Jain, Mr A Sierakowski, Miss A Greig (London)

**Introduction and Aims:** The Nail bed INJuries Analysis trial (NINJA) is the first multi-centred randomised controlled trial (MRCT) to be run by the RSTN, an organisation backed by the BSSH and the Royal College of Surgeons to promote clinical trials. We undertook a national audit of paediatric nail bed repair practice to refine the study protocol in preparation for a National MRCT.

**Material and Methods:** A national survey using the web-based Survey Monkey system was sent by e-mail to members of BAPRAS, BSSH and PLASTA.

**Results:** There were one hundred and sixteen responses (73 plastic surgeons and 43 orthopaedic surgeons). 92% of plastic surgeons and 72% of orthopaedic surgeons stated that it was their normal practice to surgically repair paediatric nail bed injuries. The most common technique used was an interrupted suture (85%) with vicryl rapide (83%). After repair 96% of surgeons replace the nail plate. Antibiotic use varies, with 29% giving no antibiotics post-operatively and 29% giving an oral course. The most common antibiotic is co-amoxiclav (66%). The majority (64%) of surgeons believe one outpatient visit is sufficient follow-up.

**Conclusion:** Our survey documents the national variation in practice in the repair of paediatric nail bed injuries. There is no agreed gold standard in the use of antibiotics, technique of repair or follow-up. This survey highlights areas of practice that will be incorporated into a national MRCT led by the BSSH.

16:35 **Discussion**

16:37 **Replantation versus revision amputation in single digit zone II amputations**  
Dr M El-Diwany, Dr A Odobescu, Miss M Balanger-Douet, Dr D Berbiche, Miss J Arsenault, Dr J Bou-Merhi, Dr P Harris, Dr A M Danino (Montreal)

**Introduction:** Replantation of single zone II amputated digits is cited by some as a relative contra-indication due to poor functional outcomes. The objective of this study was to compare the functional outcomes of zone II amputations treated with either replantation or revision amputation in our institution.

**Methods:** We conducted a comparative retrospective study. All cases of single digit amputations treated between 2007 and 2011 were screened for single digit zone II injuries. Patients were stratified based on the treatment received: replantation vs revision amputation. Participants were asked to complete the Quick-DASH, the Beck depression inventory, and a custom made questionnaire.

**Results:** Seventeen patients with single digit zone II replantations and 14 patients with similar injuries who underwent revision amputation agreed to take part in the study. Our data revealed

that time to return to work, occupation after injury, professional and social reintegration, discontinued activities, and self-confidence were not statistically different between the two groups. Average hospital stay of replanted individuals was longer at 5.5 days versus 0.36 days ( $p=0.0001$ ). Similarly, the follow-up period of these patients was also longer (25.5 versus 5.8 weeks). Furthermore, patients who underwent replantation did not have higher levels of pain or cold intolerance and the global functional and aesthetic satisfaction levels were similar between the two groups. Also, Beck and Quick-DASH scores were not statistically different. Yet, the replantation group had a significantly higher adherence rate to the same surgery (94% versus 64%).

**Conclusions:** Our results suggest that amputation is not superior to replantation in zone II single digit amputations.

#### 16:42 Discussion

#### 16:44 Proximal phalangeal osteotomy for post-traumatic malunion

Dr E K Reay, Mr A Rendall, Mr N Williams, Mr R Milner (Newcastle upon Tyne)

**Introduction:** Malunion with clinical deformity and associated functional deficit following proximal phalangeal fracture is rare and realigning osteotomies to treat malunions are similarly infrequently performed.

**Aim:** To assess the number of patients undergoing proximal phalangeal osteotomy for malunion and the presentation, operative technique and outcome of these patients.

**Methods:** A retrospective case note and radiology review was performed of all patients undergoing proximal phalangeal osteotomy in a single unit over the last fourteen years.

**Results:** Twenty-one patients with 23 osteotomies, mean age 36 with range of 15-65 years. The little finger was the most commonly realigned followed by ring, middle, index and thumb. 20% had clinical deformity at initial presentation following injury and 32% underwent operative treatment of their initial injury. Nineteen of the 21 patients presented with functional deficit following malunion at a mean follow-up of ten weeks. The majority required derotation osteotomies followed by wedge osteotomy (opening or closing). Techniques used for fixation of the osteotomy were plates (90%) and K-wires in the remainder. Clinical improvement in deformity was achieved in 90% and function was improved in 80%. The non-union rate was 9%. Seven patients required further surgery for a number of reasons, most commonly to revise the fixation for non-union or for soft tissue release for persistent stiffness.

**Conclusion:** Osteotomy for phalangeal fracture malunion is rare and the functional outcome following corrective surgery in our cohort is good although the reoperation rate is high. Plate fixation continues to be the most common operative technique for stabilising the osteotomy site.

#### 16:49 Discussion

#### 16:51 Hands of a surgeon: Second-to-fourth digit ratios in hand surgery

Mr K Joyce (Galway)

**Introduction:** The second-to-fourth digit ratio (2D:4D) is the ratio of the length of the index finger (2D) to the length of the ring finger (4D) and it is the most powerful human dimorphic digital ratio combination. Low digit ratios have been shown to be associated with increased assertiveness and risk-taking, aggression, sporting prowess and improved visuospatial ability. Good visuospatial awareness has been explicitly linked to surgical performance and it is now utilised as an essential criterion in the selection process for surgical training.

**Methods and Materials:** Digit ratios were measured on seventy plastic surgeons and 78 general surgeons at two large national surgical conferences. An age and gender matched control group of patients was used for comparison.

**Results:** Male surgeons had the lowest 2D:4D ratio (0.933 +/-0.01) and this was extremely significant compared to all other groups ( $p < 0.001$ ). No significant difference was identified between plastic surgeons and general surgeons. There was no difference between female surgeons and the control group.

**Conclusion:** We have demonstrated that male surgeons have a significantly lower 2D:4D ratio compared to an age and gender matched control and this would be in keeping with published reports that low ratios are associated with improved visuospatial ability. Surgical practice depends critically upon several factors including visuospatial performance and we have revealed an interesting link between male surgeons and low 2D:4D ratios such that increased prenatal testosterone may in part, predetermine which males are more likely to pursue a career in surgery.

#### 16:56 Discussion

#### 16:58 Fracture of the metacarpal bone: Epidemiology of 330 fractures treated in a hand unit over two years

Mr I Delikonstantinou, Mr J Patel, Mr M Sood, (Chelmsford)

**Introduction and Aims:** Very few epidemiological studies have dealt with metacarpal fractures. In this review we define the epidemiologic features of this very common hand injury.

**Material and Methods:** A retrospective review of patients' records over two years (2011-2012) was analysed for age, sex, fracture pattern, injury mechanism, treatment, complications and outcomes.

**Results:** Two hundred and seventy-six patients with 330 fractures were reviewed. The little finger was most commonly fractured (54%). The metacarpal shaft was involved in 131 (39.7%) fractures followed by the neck, the base and the metacarpal head. The leading mechanism of injury in 127 (38.5%) fractures was a punch, others being mechanical falls (25.45%), crush (8.2%) and sports related injuries (7.6%). The treatment was surgical for 203 (61.5%) fractures: percutaneous K-wiring (74, 22.4%) or open reduction and internal fixation (129, 30%). A total of sixty-six patients (24%) with 77 metacarpal fractures had complications. The most frequent were stiffness (5.4%) followed by pain (2.5%) and reduced finger extension (2.5%), K-wire migration (2.1%), pin-track infection (1.8%) and CRPS (1.8%). A significant number of patients (119 patients, 43.1%) discharged themselves. After a mean follow-up of seven months the outcome was good for the majority of patients.

**Conclusions:** Metacarpal fractures are frequent and typically involve young people. The fifth ray is most commonly involved reflecting a punch as the mechanism of injury. Complications are more frequent in fractures with operative management.

#### 17:03 Discussion

#### 17:05 Use of fabricated volar hook plates for unstable proximal interphalangeal joint dorsal fracture dislocation

Mr P Mikalef, Mr S Tan, Mr M Gupta, Mr D Power, Mr A Mishra (Birmingham)

There is no consensus in the literature with regards to the gold standard in the treatment of unstable proximal interphalangeal joint dorsal fracture dislocations. These are severe injuries that can result in poor results. Several methods of treatment have been described in the literature. We present our results of open reduction internal fixation with fabricated volar hook plates and screw fixation for unstable dorsal fracture dislocations (DFDs) of the proximal interphalangeal (PIP) joint. We performed a retrospective review of fourteen consecutive DFDs of the PIP joint treated with fabricated volar hook plate and screw fixation, measuring clinical outcomes. The age range of our patients was twenty-six to 55 years. Time to surgery varied from one to 19 days. The procedure involved volar approach, through A3 pulley, but involved minimal additional trauma due to the narrow profile of the plate. In five patients bone graft was used that was harvested from the distal radius. The technique of fabricating the plate is described. In six patients only

one screw provided enough stability to the fixation, while eight patients needed two screws. The fixation was stable enough to allow mobilisation early post-operatively. Patients were followed up for at least six months. Seven patients needed removal of metalwork and flexor tenolysis in order to improve range of movement or owing to patient's request. Mean range of movement post-operatively was 60°. Fixation of unstable PIP joint DFDs via a volar approach is technically feasible with fabricated volar hook plates and screws. This treatment allows early active range of motion and provides good stability of the fixation and good objective outcomes.

**17:10 Discussion**

**17:12 Experience of hemi-hamate osteochondral autograft (HHOCA) as treatment for proximal interphalangeal joint (PIPJ) dorsal fracture dislocations**

Miss C Rowan, Mr S McHenry (Belfast)

**Background:** Proximal interphalangeal joint (PIPJ) fracture dislocations are complex injuries which pose a significant surgical challenge to achieving an optimal functional outcome. The use of a hemi-hamate osteochondral autograft (HHOCA) as a new treatment alternative for the management of dorsal PIPJ fracture-dislocations was first proposed in 1999 (Hastings et al, 54th ASSH meeting). We have reviewed both clinical and radiological outcomes for those patients who were treated with HHOCA surgery.

**Materials and Methods:** A single surgeon case series of all patients who underwent HHOCA was identified. A retrospective review of each case was undertaken using case notes and X-rays available from the Belfast Orthopaedic Information System, Northern Ireland Electronic Care Record, Northern Ireland Picture Archiving and Communication System, and hand therapy records. Patient details recorded included age, gender, occupation, date of surgery, time from injury to surgery, percentage of articular involvement, and outcomes in the form of range of movement, X-ray appearances, complications, graft donor site morbidity and patient satisfaction.

**Results:** In total twelve patients were identified. Follow-up data was available for eleven. All patients received a HHOCA for a dorsal fracture-dislocation of the PIPJ. 91% of the patients identified were male. The mean age was 32.5 years. 60% of the patients had treatment for an acute injury (within six weeks), and one patient was five plus years from injury. The mean percentage of articular surface involvement was 44.9%. The post-operative mean active PIPJ motion was 90°. All of the patients analysed were satisfied with their outcome. There were no donor site complications and 100% had united on X-ray.

**17:17 Discussion**

**17:19 MatOrtho proximal interphalangeal joint arthroplasty: Minimum two-year follow-up**

Ms O Flannery, Mr O Harley, Mrs A Birch, Mr M Hayton, Professor I Trail, (Wigan)

**Introduction and Aims:** The MatOrtho proximal interphalangeal replacement (PIPR) is a cementless cobalt-chromium metal-on-polyethylene mobile bearing surface replacement arthroplasty. The aim of this study is to report the outcome and complications from the MatOrtho PIPR at a minimum of two years of follow-up from a single institution.

**Materials and Methods:** A retrospective case review was performed on all MatOrtho PIP joint replacements performed with a minimum of two-year follow-up. Patient demographics, diagnosis, implant revision and other surgeries were recorded. Subjective and objective outcomes were evaluated at latest follow-up including pain scores, range of motion and radiographic assessment.

**Results:** One hundred and nine implants were inserted in 56 patients. Nine implants (6 patients) were lost to follow-up. Of the remaining one hundred implants 75 were female, the average age at time of surgery was 64 years and the principal diagnosis was osteoarthritis in 77%. The average follow-up was forty-six months. The revision rate was 12%. Eight joints were revised to the NeuFlex (silicone rubber) prosthesis, three were converted to an arthrodesis and one had exchange of the MatOrtho prosthesis. There was a significant improvement in pain scores, with

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17:24–19:30

sixty-two out of 72 joints being pain free at rest. There was an improvement in functional scores post-operatively but no improvement in range of motion. Nine percent showed some radiological periprosthetic lucency but no clinical loosening was observed.

**Conclusion:** The survival of the MatOrtho PIP joint arthroplasty was 88% at a minimum of two years follow-up. Patients can be advised that the procedure achieves good pain relief, improvement in functional scores but does not improve range of motion.

**17:24 Discussion**

**17:30 Annual General Meeting (open to Full Members and Associates only)**

**19:30 (for 20:15) Society Dinner - Sarastro Restaurant, Covent Garden**

# NOTES

08:30 Registration

### Keynote lecture

Chairman: Professor V C Lees

09:00 Nerve compression in the upper limb  
Mr I Grant

### Anatomical demonstrations

Chairmen: Professor V C Lees, Mr P P Grieve

09:30 Median nerve - Carpal tunnel release  
Mr M A Pickford

09:40 Median nerve - Anterior interosseous nerve entrapment  
Mr K J Cronin

09:50 Median nerve - Pronator syndrome  
Mr K J Cronin

10:00 Ulnar nerve - Release at the elbow  
Mr H P Giele

10:20 Ulnar nerve - Release at the wrist  
Mr H P Giele

10:30 Radial nerve - Supinator syndrome  
Mr K J Cronin

10:40 Radial nerve - Radial tunnel syndrome  
Mr K J Cronin

### Rapid fire session

Chairmen: Mr R Eckersley, Miss P A Eadie

10:50 What a difference a 'block' makes - An audit on the impact of regional anaesthesia for hand surgery  
Mr A Smith, Dr C Egeler, Dr I Brauner, Mr A Bebbington, Mr D Russell, Mr D Newington (Swansea)

**Introduction:** Regional anaesthesia for hand surgery patients has become an established method of practice over the past ten years. This paper evaluates its contribution to service provision and the significant effect it has had on the evolution of an almost entirely 'Ambulatory Care' practice at Swansea.

**Materials and Methods:** In late 2005, the majority of elective orthopaedic hand surgery at Swansea moved to the Day Surgery Unit at Singleton Hospital. Anaesthetists skilled in regional anaesthetic techniques have been deployed to the unit and an Ambulatory Care Pathway has developed. All patients undergoing hand surgery in 2006, 2008, 2010 and 2013 have been analysed.

**Results:** In 2005, 43% of our patients were treated as day cases but by 2013 this figure is greater than 95%. In 2006, only 13% of patients received a regional anaesthetic 'block' and currently over 40% have their hand surgery using this technique. General anaesthetic is now only used in 6% of patients, down from 24% in 2006. The percentage of cases treated with local anaesthetic 'infiltration' or 'ring block' remains approximately half of all those treated. Notable benefits have occurred with increased efficiency and patient throughput. This is highlighted by a 25% increase in the actual number of patients treated with further improvements following the appointment of another consultant in 2009.

**Conclusion:** This audit illustrates the significant impact regional anaesthesia has had on the provision of hand surgery in Swansea. It has improved the patient experience coupled with prolonged post-operative analgesia. It has allowed complex procedures to be undertaken as day cases obviating the need for general anaesthetic, and freed up valuable bed capacity.

#### 10:53 Discussion

#### 10:54 Routine collection of patient reported outcomes at Sheffield Hand Centre: What have we learnt?

Miss K Steele, Miss K Sharma, Mr G Miller, Miss M Birks (Sheffield)

Implementation of routine collection of patient reported outcome measures (PROMs) data requires departmental engagement and investment. It offers invaluable information directly from patients that can be used for service improvement, commissioning and benchmarking purposes. We have developed a low maintenance, sustainable, resource-light system for routine acquisition of PROMs and present the lessons learned from the first three hundred patients.

Patients listed for elective surgery at the regional hand centre were offered the opportunity to complete a tablet-based questionnaire. Content includes Patient Outcomes of Surgery (POS)-Hand/Arm, EQ5D and Patient Experience Measures with direct electronic data transfer to a database.

PROMs collection was acceptable to patients although a small number required assistance to use the tablet. 98% of patients reported respect, communication and meeting of expectations to be good or excellent. Of the five most prevalent hand conditions seen in our service, reporting of symptoms across all domains was highest in carpal tunnel syndrome, intermediate in base of thumb pain and triggering, and lowest in Dupuytren's contracture and ganglions. 94% of patients thought the results of surgery were as good as or better than expected and 87% would recommend the operation to a friend with the same problem.

Recording PROMs on a routine basis presents logistical challenges but gives the opportunity to learn from our patients objectively and improve staff morale through feedback. We anticipate that PROMs data will be a useful adjunct for improving our own service and informing hand surgery commissioning in our region.

#### 10:57 Discussion

#### 10:58 The position of function: A prospective audit of practice

Miss L Cooper, Mrs N Burr, Mr B Sivakumar (London)

**Introduction and Aims:** The position of function is designed to minimise soft tissue stiffness and contracture during prolonged immobilisation of the hand. In our unit, this position is achieved immediately post-operatively using plaster of Paris (POP) casts fashioned in the operating theatre. These are replaced by hand therapy within a week, with customised thermoplastic splints. The aim of this audit was to assess the success in achieving the position of function with post-operative POP splints in our unit.

**Materials and Methods:** All patients presenting to the hand therapy department over one week with a volar POP splint in the position of function for a hand injury were included. The angles achieved at the wrist, metacarpophalangeal (MCP), proximal (PIP) and distal (DIP) interphalangeal joints were prospectively recorded with a goniometer, as were the indications for splinting and basic demographic details. These were compared to the ideal angles of: 20-30 extension at the wrist, 60-70 flexion at the MCPJ, and neutral at the PIPJ and DIPJ. Functional outcomes at discharge from hand therapy were recorded from the hand therapy notes.

**Results:** Forty-one casts were measured, 20 created for tendon injuries and 21 for hand bone fractures. Three POP casts were fractured on presentation, two deemed too short at the forearm and two at the fingers by the attending hand therapist. The median extension at the wrist was

10 (IQR 4–20 extension); flexion at the MCPJ was 30 (IQR 20–40 flexion); PIPJ 16 (IQR 0–25 flexion) and DIPJ 0 (IQR 0–7.5). Functional outcomes will be assessed at thirty days (collection ongoing).

**Conclusions:** The position of function is being inadequately achieved post-operatively in our unit, which may have implications on the functional outcomes of the patient. This may be due both to a lack of understanding of the biomechanics of the hand and angles required for the position of function, and to poor compliance using POP as a material, which must fully dry before force is put through the cast. Both hand biomechanics in the position of function/intrinsics plus position, and material considerations with POP are discussed.

#### 11:01 Discussion

#### 11:02 Service improvement in post-operative splinting: An advantageous intervention

Miss L Cooper, Ms N Hachach-Haram, Mrs N Burr, Ms B Jemec (London)

After hand injury or surgery, the hand is often immobilised in the position of function, also known as the intrinsic-plus or Edinburgh position, in order to reduce stiffness and contraction of soft tissues. In our unit, immobilisation in this position is achieved using plaster of Paris, until a thermoplastic splint is made at hand therapy.

The aim of this study is to create a cost and time effective method of splinting patients' hands, in the position of function, using pre-made thermoplastic splints.

One hundred hands were measured in order to obtain three general sizes for hand splints for men and women, based on the varying distance from the distal palmar crease to the proximal wrist crease. Position of function splints were fabricated in the hand therapy department and applied in theatre instead of traditional plaster of Paris to forty consecutive patients by the senior author (BJ). When patients attended hand therapy post-operatively, the splint was moulded appropriately, as usual. Time of applying the thermoplastic splint was compared to plaster of Paris splints in theatre, and the time taken to make the thermoplastic splint in the department was also compared. Subjective outcomes were sought from therapists and patients, and patient thirty-day follow-up outcomes were compared.

The outcomes of the study are presented with specific attention to the advantages and disadvantages of this method.

Pre-fabricated thermoplastic splints may offer a time efficient solution to post-operative splinting, both in the operating theatre, and in the hand therapy department at the first visit.

#### 11:05 Discussion

#### 11:06 Alive fingers need awake surgeons

Mr A Shiatis, Miss H Lloyd-Hughes, Mr A Pabari, Ms A Mosahebi (London)

**Introduction:** The traumatic amputation of a digit is a plastic surgery emergency and can lead to significant morbidity and functional deficit. One of the factors hypothesised to affect post-operative outcome is the time to replantation from time of injury. It is believed that cold ischaemia of digits should be no more than 12 hours although some centres report successful replantation after 24 hours. Despite this, current trends in the management of such injuries tend to favour immediate surgery and this has traditionally meant that a complex procedure is often performed out of hours by junior members of the surgical team. We present our experience of managing these injuries in a tertiary referral centre and endeavour to evaluate outcomes based on the time of surgery.

**Method:** We performed a retrospective study of all digital replantations performed in our unit over ten years. The ischaemic time, time of surgery, grade of operating surgeon and surgical outcome was retrieved from our electronic records.

**Results:** One hundred and sixteen replants were reviewed. Eighty-nine (77%) were performed on CEPOD and 27 (23%) on the hand trauma list. Twelve (13%) of the CEPOD cases and 19 (70%) of the replants on elective hand trauma lists were performed by a consultant grade. Failure and terminalisation was reported in 15 (19%) CEPOD and 2 (5%) of hand trauma list cases.

**Conclusion:** Our results indicate that there is a significant difference in the success rate of digital replantation performed out of hours and those listed on a trauma list the following morning. In our experience, cold ischaemia time does not affect the eventual outcome of surgery. However, our results do show that patients operated on elective hand trauma lists have better surgical outcome than those operated on CEPOD lists.

#### 11:09 Discussion

#### 11:10 Motor sparing effect of a novel tourniquet block is useful in distal hand day case surgery Mr P A Storey, Dr A Searle, Dr Z Sheikh (Derby)

**Introduction:** A wide range of hand operations could be performed under local anaesthetic infiltration or distal nerve block, but these anaesthetic techniques are limited by a tourniquet tolerance of twenty minutes, resulting in the widespread use of regional anaesthesia. Maintaining active contraction of the forearm muscles is important for cases such as tenolysis, in order to illustrate to patients their active range of motion intra-operatively and to allow commencement of immediate post-operative therapy. However, forearm muscles are paralysed following regional anaesthesia. We have therefore developed a novel block technique, which can improve tourniquet pain tolerance whilst maintaining active finger motion.

**Methods:** Block Technique - Eight to ten millilitres of 1% prilocaine is injected around the musculocutaneous nerve by visualising the nerve with ultrasound in the plane between coracobrachialis and biceps. A subcutaneous infiltration of ten millilitres of 1% prilocaine is made into a single insertion point in the medial upper arm to block the intercostobrachial and medial brachial cutaneous nerves. This novel block technique was used in a prospective observational study of forty consecutive patients undergoing distal hand surgery. The tourniquet VAS pain scores were recorded twenty minutes into the operation.

**Results:** Thirty patients (75%) were unaware of the tourniquet, five were aware of it but did not describe it as tight, and five described it as comparable with a tight blood pressure cuff.

**Conclusion:** The use of our tourniquet block obviates the need for a full brachial plexus block, thereby allowing the maintenance of intra-operative and immediate post-operative finger motion.

#### 11:13 Discussion

#### 11:14 Ultrasound guided percutaneous annular pulley release for trigger finger Miss J Ruston, Mr O Bassett, Dr R Pearce, Mr R Eckersley, Dr G Rajeswaran, Ms E Katsarma (London)

**Introduction:** Trigger digit is a common cause of hand pain and loss of function. Treatment consists of hand therapy, splints, corticosteroid injections and finally open release of the constricting annular pulley. Our department developed the use of ultrasound guided percutaneous annular pulley release, using a standard hypodermic needle bent at two points. Published by the senior authors in 2009, this technique allows visualisation of the tendon and neurovascular bundle, and was found to be promising. This study aimed to evaluate the long-term use of this technique.

**Methods:** Retrospective case note review of all patients undergoing ultrasound guided A1 pulley release for trigger digit, between 2009 and 2014. All patients had first trialled conservative and corticosteroid treatments within the hand surgery department. Presenting symptoms, ultrasound findings and outcomes were evaluated.

**Results:** Following the pilot study of thirty-five patients, in which 91% had complete resolution of symptoms, we present a case series of two hundred patients, who underwent ultrasound guided percutaneous A1 pulley release between 2009 and 2014. This is the largest series described thus far and results are in concordance with the original paper, with most patients having complete resolution of symptoms, minimal complications and high patient satisfaction.

**Conclusion:** We support that A1 pulley release under ultrasound guidance for the treatment of severe triggering of the digit is a safe and effective procedure, well tolerated by patients and performed in an outpatient setting.

#### 11:17 Discussion

#### 11:18 Infected gout: The fate of the finger

Dr I Anderson, Miss E Reay, Mr N Williams (Newcastle upon Tyne)

**Introduction:** The digits are commonly affected by gout which can be complicated by infection. Little is known about the outcome of those digits.

**Aim:** To assess outcome of patients with infected gout of the digits and identify factors which predict the need for amputation.

**Methods:** Patients with infected gout affecting the digits were identified and cross referenced with those undergoing amputation or terminalisation using our trust's coding system. A case note review was performed to compare patients that underwent amputations to those that did not.

**Results:** Twenty patients were diagnosed with infected gout of the fingers or thumb over a 12-year period. Seven patients were managed with terminalisation of the affected digit (35%). The mean age of patients undergoing amputation was 86 years, compared to 72 years in the non-amputation group. The mean duration of symptoms in the amputation group was double that of the non-amputated group (32 versus 14 days). The proximal interphalangeal joint was the affected joint in 86% of the amputated cases compared to 38% in the non-amputated group. The mean time from presentation to theatre was longer in the amputation group (five days versus one day). Patients in both groups received antibiotic therapy within 24 hours of presentation.

**Conclusion:** Factors leading to a better outcome from infected gout in the fingers include younger age, DIPJ versus PIPJ involvement and earlier presentation. Management decisions such as early operative intervention with washout and debridement as well as early administration of intravenous antibiotics also appear to improve outcome.

#### 11:21 Discussion

#### 11:25 Refreshments and trade exhibition

#### How I do it

Chairmen: Miss B Crowley, Mr D Swain

#### 11:50 Injection techniques in the hand

Mr R Hanson

#### 12:00 Locking plate for distal radial fractures

Mr M O'Sullivan

#### 12:10 Management of condylar fractures of the phalanges

Mr D J Shewring

#### 12:20 PIPJ contracture release

Mr M A Pickford

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12:30–15:00

12:30 Simple syndactyly release  
Mr A N M Fleming

12:40 The use of the hemi-hamate for base of middle phalanx fractures  
Mr S McHenry

## Comparative anatomy

Chairman: Mr R H Milner

12:50 The evolution of forelimb function  
Mr K Herbert

13:20 Lunch and trade exhibition

14:15 Presidential handover

14:20 Hand trauma provision in the UK  
Miss R L Lester

## Parallel sessions

Lecture Theatre 1 (continues below)

Lecture Theatre 2 (turn to page 35)

14:40 Overseas services

14:40 Dupuytren's disease

15:00 Free papers: Wrist and forearm

14:40 Overseas services  
Mr S P Hodgson (Speaker)

## Free papers: Wrist and forearm

Chairmen: Mr J L Hobby, Mr J G O'Beirne

15:00 Improving the management of suspected scaphoid fractures in the emergency department  
Dr J Timms, Mr D P K Yeoh, Dr S Bellringer, Mrs L Leonard (Brighton)

**Introduction:** Scaphoid fractures are common, accounting for 11% of all hand fractures (Suh et al, 2010). The initial treating health care professional should have a high index of suspicion to avoid missing scaphoid fractures. We aim to improve the rates of diagnosis and initiation of early immobilisation via an education programme comprising of local presentations and posters.

**Methods:** We propose the use of a simplified method to diagnose scaphoid fractures. Criteria include an appropriate mechanism of injury and complaint of radial sided wrist pain. We propose using three signs which have been shown to be the most sensitive and specific tests. These are: pointing to the scaphoid as the maximal site of pain, pain on resisted supination and pain on ulnar deviation of the wrist (Steenvorde et al). We performed a retrospective audit examining the treatment of scaphoid fractures over a period of one month. This was then compared to a prospectively performed audit after initiation of an education programme, again over a period of one month.

**Results:**

	Audit 1 (pre education)	Audit 2 (post education)
No of patients	117	59
Ratio seen by doctor:nurse (%)	20:80	37:63
Late presentation	10%	5%
Clear mechanism documented	57.4%	76.3%
Documented positive signs	4.4%	40.7%
Suspected scaphoid fracture	17.6%	10.2%
Confirmed scaphoid fracture	7.4%	35.6%
Correct treatment initiated	40%	97%

**Conclusion:** Our education programme improved the rate of diagnosis and early management of scaphoid fractures. Our health care professionals found the simplified protocol easy to follow and giving clear guidance on departmental policy. We will perform a further audit to see if these improvements are maintained.

**15:05 Discussion****15:07 The stabilising effect of the anterior oblique ligament at the trapeziometacarpal joint in cadaveric limbs**

Mr M McCann, Miss P Rust, Dr R Wallace (Edinburgh)

**Introduction and Aims:** The trapeziometacarpal joint is inherently unstable relying on ligament restraint to prevent subluxation. Subluxation occurs either after acute ligament injury or more commonly with osteoarthritis (OA). Abductor pollicis longus (APL) is the only tendon to attach to the base of the metacarpal, thus the main deforming force. The exact mechanism of stabilisation remains unknown, but the anterior oblique ligament (AOL) may be key. The aim of this study was to measure the direction of subluxation resisted by the AOL.

**Materials and Method:** Cadaveric limbs and a custom-made biomechanical jig tested the stabilising effect of AOL against subluxation in three planes: radial, dorsal and dorsoradial. Three fresh frozen hands were dissected to expose the trapeziometacarpal joint (TMCJ) leaving all ligaments, capsule and APL attachment in place. The forces required to displace 0.5mm between metacarpal and trapezium in these three planes were measured before and after AOL division.

**Results:** The average force required for displacement in the dorsoradial plane prior to AOL division was 6.68N, following division this significantly decreased to an average of 1.15N. Paired t-tests were used to compare the data before and after AOL division, there was a significant difference in dorsoradial subluxation ( $P < 0.001$ ). There was no significant difference in radial or dorsal subluxation after division of AOL. On the thumbs the attachment of APL was at the dorsoradial corner of the metacarpal. These results confirm that AOL is a significant stabiliser against dorsoradial, but not of radial or dorsal subluxation.

**Conclusions:** The main role of AOL is to prevent dorsoradial subluxation, the direction of muscle pull of the APL muscle. This supports surgical reconstruction of the AOL as the primary stabiliser against subluxation of the thumb before OA develops.

**15:12 Discussion****15:14 The vascularised medial femoral corticoperiosteal flap for thumb reconstruction**

Mr K Amin, Miss J Ruston, Miss N Darhouse, Mr B Sivakumar, Mr D Floyd (London)

Fracture non-union presents a reconstructive challenge, with complications often resulting from poor vascularity. This paper illustrates the use of a vascularised Medial Femoral Condyle (MFC) corticoperiosteal flap for reconstruction of a pseudarthrosis of the proximal phalanx of the thumb.

Our patient presented with non-union of a fractured proximal phalanx of the dominant thumb resulting in significant deformity, limited strength and function. Excision of the affected bone left a 25mm longitudinal defect. A MFC corticoperiosteal flap was harvested based on the superomedial genicular pedicle. The flap was sculpted into a prism shaped 'neophalanx' and inset into the defect. The pedicle was anastomosed to the princeps pollicis artery and a superficial tributary of the cephalic vein.

New bone growth was seen on follow-up radiographs and the patient noted a substantial improvement in function. The MFC flap is a useful reconstruction of bony defects, with minimal donor morbidity. The versatile flap can be crafted to requisite shapes and is useful for small defects in the hand, including phalangeal reconstruction.

The above case illustrates the technique of sculpting the flexible flap into a specific shape to produce a vascularised neophalanx, which has yet to be described in the literature.

Reference is made to the Kapandji score and DASH scores with follow-up X-rays.

#### 15:19 Discussion

#### 15:21 Comparison of Integra®, Pyrodisk™ and trapeziectomy for basal thumb arthritis in a non-originator series

Mr B Singh, Mr R Bawale, Mr P Mohanlal, Mr H Cottam, Dr K Rai, Dr A Goyal (Gillingham)

**Introduction:** Osteoarthritis of the carpometacarpal (CMC) joint of the thumb is a disabling condition for which various surgical techniques have been described in the literature. Trapeziectomy with and without ligament reconstruction with tendon interposition (LRTI) has been shown to be a successful operation. The major drawback of this procedure is shortening of thumb leading to weak grip strength. The Integra® Pyrodisk™ (Osteotec) was introduced with the aim of maintaining the height of the thumb and avoiding the shortening and in turn leading to better grip strength. It is made out of pyrocarbon which has a modulus of elasticity close to that of bone.

**Aim:** The aim of this study was to see if there is any difference in the outcome following Integra® Pyrodisk™ compared to trapeziectomy with and without LRTI over a four-year period with a minimum follow-up of 12 months.

**Methods:** We prospectively followed up twelve cases in ten patients who underwent Integra® Pyrodisk™ replacement for basal thumb arthritis. Similar age and sex-matched patients who underwent trapeziectomy and trapeziectomy with LRTI were used for comparison. A split tendon of APL was used to perform a dynamic suspension arthroplasty by looping it around the FCR tendon. All patients were operated on by using longitudinal incision over the dorsum of the thumb CMC joint. Both these groups of patients were immobilised in a back slab for a period of two weeks after which they were mobilised with the help of the hand therapist in a splint. Integra® Pyrodisk™ replacement was performed through an extended approach on the dorsum of the CMCJ and post-operatively were put in plaster cast for four weeks followed by mobilisation in the splint and with hand therapy. Patients had radiographs as indicated post-operatively, Disabilities of the Arm, Shoulder and Hand (DASH) scores. Patient rated wrist/hand evaluation (PRWHE) which includes pain and function score. All the data was collected prospectively.

**Results:** Mean follow-up was fifteen months (range 12 - 48 months) in all three groups. All patients maintained full range of motion. By the one-year follow-up, mean pinch strength returned to 59%± 19.1% of the contralateral limb strength.

**Group 1 – (Trapeziectomy):** The pre-operative DASH score improved by an average of 31 whilst the PRWHE score improved by 43 points.

**Group 2 – (Trapeziectomy + LRTI):** The pre-operative DASH score improved by an average of 34 whilst the PRWHE score improved by 49 points.

**Group 3 – (Pyrodisk™):** The pre-operative DASH score improved by an average of 32 whilst the PRWHE score improved by an average of 56.

There was a shortening of about 7mm (5 - 9) in simple trapeziectomy, 6mm (4 - 8) in trapeziectomy + APL LRTI and 0.8mm (-1 to 2) shortening noted in the Pyrodisk™ replacement group.

**Complications:** Two patients with symptoms of synovitis were successfully treated with a corticosteroid injection. The average post-operative grip strength was 9.5 kg. Both tip and key pinch between thumb and index finger averaged about 50% of normal subjects. One patient in each group developed temporary parasthesia in the superficial radial nerve distribution which resolved over three months.

**Conclusion:** This study shows excellent results of Integra® Pyrodisk™ at the minimum one-year follow-up compared with other standard methods of treatment for basal thumb arthritis. There was no increase in complication rate and the thumb height was maintained better than by the other techniques. The authors believe this to be a good alternative in selected groups of patients.

#### 15:26 Discussion

#### 15:28 Is there a difference between trapezial denervation and trapeziectomy? A clinical trial Mr A Salibi, Dr R Hilliam, Professor F Burke, Mr C Heras-Palou (Derby)

**Introduction and Aims:** Trapeziectomy is considered to be the 'gold standard' procedure for first carpo-metacarpal joint (CMCJ) osteoarthritis (OA). Trapezial denervation (TD) offers the benefit of a shorter operation with bone and joint preservation with swift post-operative rehabilitation. This trial aimed to compare functional outcomes, quality of life, patient satisfaction and cost effectiveness following these treatments.

**Material and Methods:** This study was designed as a prospective clinical trial comparing TD with trapeziectomy for the surgical treatment of first CMCJ OA from December 2005 until November 2013. A range of functional outcome assessments was used pre-operatively, at three, six, 12 months and five years following surgery. These assessments included measurements of strength/motion, VAS scores, in addition to Michigan and EQ5D questionnaires. A two-sample t-test and Mann-Whitney test were used to analyse data.

**Results:** A total of forty-five patients were studied out of 55 recruited for this trial. Age ranged from forty-four to 77 (mean =59). Thirty five patients underwent TD and ten had trapeziectomy initially. Nine patients were converted to trapeziectomy within an average of six to 12 months. There was no significant difference in the functional outcomes at different points of follow-up between the two treatment groups. Similarly, there was no significant difference in the time of return to work or cost effectiveness.

**Conclusion:** There was no difference in functional outcomes, quality of life, patient satisfaction and cost effectiveness between the two treatments. Therefore, TD does not appear to be superior to trapeziectomy. However, the advantage of rapid rehabilitation makes it more favoured by patients, but at the expense of higher reoperation rate.

#### 15:33 Discussion

#### 15:35 Ulna shortening osteotomy with the Acumed system: Our experience Mr P Brown, Mr I Mahmood, Dr G Slater, Mr G Cheung, Mr D Brown (Liverpool)

We present our experience to date of using the procedure specific Acumed ulna shortening osteotomy plate in the treatment of ulna impaction. Our aim was to compare our rates of union and

implant removal with those in the published literature. We believe this to be the largest reported series not to involve the systems designer.

We undertook a retrospective review of all patients who underwent ulna shortening using the Acumed plate since the beginning of its use in our institution. Coding analysis and search of our theatre database produced thirty-six patients with operations between October 2007 and February 2014.

All case notes and radiographs were reviewed for evidence of non-union, revision, removal of metal work and any other associated complications. There were no patient reported outcome measures available for analysis.

Thirty-six patient records were available. All were complete. There were fifteen male and 21 female patients. Average age at operation was 51 (range 17-72). The most prevalent cause of radioulna length discrepancy was a previous distal radius fracture resulting in relative shortening of the radius.

The average length of available follow-up to date is eleven months (range 1-57, median 5).

There was one delayed union to date, however follow-up is only three months for this patient. Interestingly, this is in the only smoking patient in our group, a risk factor which has previously been strongly correlated with risk of fracture non-union in both, elective and trauma settings. Removal of metal was carried out in three patients (8.3%) for pain at the implantation site, all of which resolved following removal of plate. There was one periprosthetic fracture at the distal tip of a plate following a patient fall. This was treated non-operatively and resulted in successful union and no further problems. Two patients had their fixation revised to conventional DCP and went on to union.

The use of the Acumed ulna osteotomy plate results in a reproducible correction with excellent stability of fixation and good rates of union. There is a significant reduction in the need for implant removal due to irritation as compared to other available fixation systems. Our rate of 8% compares favourably with the wide range of reported incidence of 8-55%. Whether this is attributable to plate design or placement is difficult to establish. It is substantially better than the rate quoted for other marketed systems: Synthes (27%) and Trimed (24%). Our union rate of 100% is in line with that of the largest available study using this treatment method.

#### 15:40 Discussion

#### 15:42 Electrogoniometer measurement and directional analysis of wrist angles and movements during the Sollerman hand function test

Mr T Dauncey, Mr H Singh, Professor J Dias (Leicester)

Wrist movement along the dart throwing motion (DTM) plane is thought to minimise carpal movement and rotation, and hence produce a controllable and stable plane of motion for activities of daily living (ADL). We have investigated wrist movement properties (axis, area and location) whilst performing everyday activities in addition to the influence of age, ethnicity, gender, joint hypermobility and hand dominance on wrist movement.

A flexible biaxial electrogoniometer and a custom built Sollerman hand function test kit were used to measure wrist movement simultaneously in the two planes of movement, whilst replicating ADL. Eighty-three volunteers with normal wrist function completed our study.

80% of ADL used the DTM plane; the majority of these being the rotation and power grip tasks. The majority of ADL were performed with a central position within the ulnar-extension quadrant of wrist movement. Increasing age and differences in hand dominance had similar effects on wrist movement during ADL; increasing the use of oblique movements, larger ellipse areas and task completion nearer to central location in the radio-ulnar deviation (RUD) plane.

Gender, ethnicity and joint hypermobility were not found to significantly influence functional wrist movement.

High use of the DTM during ADL reflects its importance on wrist movement during occupational and sporting activities. The changes with age and hand dominance may be related to repetition and practise of tasks over time eventually increasing the wrist's efficiency. These findings may be used to influence the development of more realistic wrist positioning during joint arthroplasty and provoke further research into differences between independent variables.

15:47 Discussion

15:49 The influence of social deprivation and seasonality on scaphoid fracture epidemiology at a large UK teaching hospital

Mr K Garala, Dr N Taub, Professor J Dias (Leicester)

**Introduction and Aims:** We aim to calculate a yearly rate of scaphoid fractures at a large teaching hospital. We will calculate a UK annual scaphoid fracture burden. Our second goal is to explore influence of social deprivation on scaphoid fractures. Finally, we will identify if there are any seasonal trends in scaphoid fractures.

**Material and Methods:** Five hundred and thirty scaphoid fractures over a 41-month period. Sixty-two female patients and 468 male patients. Using Leicester and Rutland (LNR) specific datasets and that from the 2011 census, yearly fracture rates were calculated for age and gender specific groups and then extrapolated to national statistics. The influence of social deprivation was examined by comparing patient postcodes with the Index of Multiple Deprivation (IMD) 2010. Seasonality was examined by noting the date of the scaphoid imaging on the day of presentation.

**Results:** Scaphoid fracture incidence in LNR was fifteen fractures per 100,000. Men between 15–19 years had the highest rate of 95 fractures per 100,000. In women, the highest rate of twenty fractures per 100,000 was observed in 10-14 year olds. We estimate annual UK scaphoid fracture burden at 16368. The rate of scaphoid fractures significantly decreased as wealth increased ( $p < 0.001$ ) from a rate of 20.3 in the most deprived quintile to 11.0 in the least deprived quintile. The highest scaphoid fracture rates were in June with a rate of 21.5 fractures per 100,000 compared to the lowest rate found in February with a rate of 11.6 ( $p < 0.05$ ).

**Conclusions:** The estimated annual scaphoid fracture burden in the UK is 16368. Male patients are more at risk than females. More deprived patients are at higher risk of scaphoid fracture. There are higher rates of scaphoid fracture in summer and autumn.

15:54 Discussion

**Free papers: Dupuytren's disease**

Chairmen: Professor D Warwick, Mr C Riordan

**14:40 Unravelling the genetic influence on Dupuytren's disease**

Mr M Ng, Ms L Southam, Mr D Izadi, Dr A Espirito Santo Fonseca, Dr D Thakkar, Professor J Nanchahal, Dr E Zeggini, Mr D Furniss (Oxford)

Dupuytren's disease (DD) is a complex genetic condition, which affects approximately 10% of the UK population. In addition to the genetic predisposition, risk factors including diabetes, hypercholesterolemia and smoking. Our aim was to acquire a better understanding of the genetic predisposition to the disease and the dysregulation of the underlying molecular mechanisms by discovering novel loci, in order to develop novel therapeutic strategies. As part of the BSSH Genetics of Dupuytren's Disease collaboration, we performed a Genome Wide Association study (GWAS) utilising a UK case-control cohort consisting of 8185 individuals. They were genotyped on the Illumina CoreExome DNA microarray to assess the allelic variation of 538,448 positions across the whole human genome. For immunocytochemistry and gene expression assays, we used primary macrophages and myofibroblasts cells from patients who underwent fasciectomy. We replicated association at all nine previously described loci. In addition, we discovered four new regions – on chromosome 6 (near SUMO4); two on chromosome 14 (in MMP14, and near ATL1) and 15 (near ACAN) - associated at genome-wide significance ( $p < 5.0 \times 10^{-8}$ ). Preliminary expression experiments suggest that the genotype at the most highly associated variant (rs16879765,  $p = 3.21 \times 10^{-36}$ ) alters the expression of EPDR1 and SFRP4 in myofibroblasts. Our results have provided us further insights into the molecular mechanisms crucial for the development of DD. This information will be used in the future to develop novel therapeutic strategies aimed at preventing primary disease or recurrence after intervention. Further imputation and functional analyses are ongoing.

**14:45 Discussion****14:47 Correlation between function and deformity in Dupuytren's disease**

Professor D Warwick, Dr P Worsley, Mr D Graham (Southampton)

**Introduction:** PROMs should now be an integral part of hand surgery practice and will have increasing importance in allocating scarce funds. PROMs should reflect the underlying condition (construct validity). The QuickDASH is widely used across hand surgery but many of the domains (e.g. tingling, pain, sleep) are not affected in Dupuytren's disease (DD) which is likely to affect its validity. The Southampton Dupuytren's Scoring Scheme (SDSS) has just five domains, each relevant to Dupuytren's disease. We aim to further confirm the validity of the SDSS.

**Materials and Methods:** Two hundred and eighty patients with DD completed both the QuickDASH and the SDSS simultaneously just prior to treatment.

**Key Results:** The correlation between SDSS and deformity for QuickDASH was  $r = -0.04$  ( $p = 0.59$ ) and for SDSS  $r = 0.19$  ( $p > 0.01$ ).

**Conclusion:** Whilst a condition specific score (SDSS) has better validity than a generic score (QuickDASH) in DD, nevertheless the correlation between deformity and function remains poor. Other factors, rather than deformity alone, have greater determination for the functional effect of DD.

**14:52 Discussion****14:54 The assessment of composite thumb motion using digital motion tracking: A pilot study**

Mr E P Jesudason, Mr M Edwards, Professor N John, Mr R Harding, Mrs H Griffin, Mrs L Booth (Bangor)

Assessment of motion of the thumb can be difficult to assess as movement occurs in three degrees of freedom, i.e. flexion-extension, abduction-adduction and rotation. There are numerous

methods of measurement of this motion as an outcome measure, but none are perfect, subject to errors in both inter and intra-observer reliability. Measures such as the Kapandji score of thumb function are also subject to similar flaws; one can have significant basal thumb joint pathology and yet score well on this measure. Added to this is that motion of the thumb is difficult to measure in isolation.

We present the results of a pilot study using a commercially available digital motion capture device (Leapmotion, San Francisco, CA, USA) and a bespoke computer algorithm, to assess thumb motion in fifteen healthy volunteers (30 thumbs). We assessed the palmar and radial abduction and first web space span using the Leapmotion and compared this to measurement using a standard goniometer and ruler.

Data from the Leapmotion correlated well with data collected manually, with good inter-observer agreement in all measurements. This new computational method had the potential for use as a composite outcome measure in thumb disorders. In addition to the parameters mentioned above the computer algorithm also collected a vast amount of raw data, such as velocity of motion, minimal and maximum movement in each plane and the total area of circumduction. All of these could be used as outcome measures. Velocity of thumb movement showed promise, as it is postulated that arthritic and painful thumbs are stiffer and hence move slower. These data could potentially be used to track recovery from injury or surgery.

#### 14:59 Discussion

#### 15:01 Recovery, responsiveness and minimal important differences after fasciectomy and dermofasciectomy

Mr J Rodrigues, Dr W Zhang, Professor B E Scammell, Professor T R C Davis (Nottingham)

**Introduction:** This prospective cohort study assessed early recovery after fasciectomy and dermofasciectomy for Dupuytren's disease.

**Methods:** Patients were prospectively recruited and underwent fasciectomy or dermofasciectomy. DASH scores were completed pre-operatively, at three, six and 52 weeks. The URAM scale was published after recruitment started. Later entrants also completed pre-operative and one year post-operative URAMs. All completed the Global Rating of Change (GRC) tool at one year.

**Results:** Seventy-one out of 101 patients completed follow-up, of which 31 completed URAMs. The DASH deteriorated between pre-op and three weeks post-op. It improved between six weeks and one year ( $p=0.03$ , Turkey's test) and only became 'asymptomatic' (DASH<15, according to the developers) by one year. There was no significant difference in DASH between fasciectomy and dermofasciectomy at any time point. The effect size of the DASH was 0.58 and the URAM was 0.84. The area under the curve (AUC) of a Receiver Operating Characteristic (ROC) curve demonstrates how well the PROM correctly identifies clinically important change, with AUC=1 best, and AUC=0.5 worst. For the DASH, the AUC was 0.51, indicating that it could not identify meaningful change as determined by the GRC. The AUC for the URAM ROC was 0.74, indicating that it could identify clinically meaningful change and its minimal important difference (MID) was 10.5.

**Conclusions:** Recovery after open Dupuytren's surgery takes longer than six weeks. Functional recovery is similar after fasciectomy and dermofasciectomy. The URAM, but not the DASH, identified clinically meaningful improvement. The URAM's MID (10.5) was considerably higher than reported in the published study of collagenase (2.9), perhaps reflecting differences in recovery.

#### 15:06 Discussion

**15:08 Xiapex - New information from a series of two hundred and ninety injections**  
Professor D Warwick, Mr P Worsley, Mr D Graham (Southampton)

**Introduction:** Data so far published for Xiapex refer to single joints only. We have routinely extended the indication to contractures spanning more than one joint in a single digit and to natatory (i.e. web space) cords.

**Materials and Methods:** Two hundred and ninety digits were injected with Xiapex. A large dataset was entered prospectively on a bespoke database.

**Results:**

- Combined  $n=91$ ; 93% improvement ( $103^\circ$  to  $17^\circ$ )
- Natatory cord  $n=46$ ; 85% improvement ( $130^\circ$  to  $25^\circ$ )
- MCPJ  $n=98$ ; 97% improvement ( $46^\circ$  to  $1^\circ$ )
- PIP joint  $n=52$ ; 78% improvement ( $63^\circ$  to  $8^\circ$ )
- Spontaneous overnight correction occurred fully in 23 (8%), partially in 42 (14%)
- Fourteen needed second injection to achieve correction (1:21) with seven in the first 25 cases suggesting a significant learning curve

**Complications:** 45% had one or more complications. 21% of all patients had a skin split, 14% blood blisters and 12% axillary pain. All resolved promptly. Skin splits and blisters were not more common in combined or natatory cords.

**Conclusion and new information:**

- Use of Xiapex across more than one joint or in a web space joint is reliable and will enhance cost effectiveness
- Spontaneous correction is common
- There is a significant learning curve beyond which second injections are rarely required

**15:13 Discussion**

**15:15 A retrospective comparison of surgery and collagenase injections for treatment of Dupuytren's contracture**

Dr S Bezzaa, Mr I Grant, Mr P Johnston, Mr P Gillespie (Cambridge)

**Introduction and Aims:** Patient related outcome measures were compared for patients with Dupuytren's contractures, affecting one or two digits, treated with either a single collagenase injection or with limited fasciectomy. Collagenase treatment was administered outside the NHS.

**Material and Methods:** Nineteen collagenase and 20 surgical patients were contacted post-treatment via patient reported outcome measure questionnaires (PEM, URAM and an activities questionnaire). Adequate responses were received from fifteen collagenase and 11 surgical patients. Data was analysed with the Mann-Whitney-U test. All patients achieved successful correction of their contracture.

**Key Results with Supporting Statistical Analysis:** No differences in the demographics, pre-intervention scores (URAM), post-intervention scores (PEM and URAM), or duration of pain post-treatment were demonstrated. Results showed severity of pain was significantly higher in the collagenase patients compared to surgical patients ( $p<0.02$ ). Recovery times to normal activities and driving were significantly shorter for collagenase patients compared to surgical patients ( $p<0.05$ ).

**Conclusion(s):** This study shows there is no difference between the patients pre-intervention and there is no difference in functional outcome between the groups. Collagenase patients have a shorter time to return to normal activities and driving, however, pain from treatment was more severe.

**15:20 Discussion**

**15:22 The effect of post-operative night splinting in Dupuytren's disease: A meta-analysis of randomised controlled trials**

Mr J N Rodrigues, Mr G Becker, Ms C Ball, Dr W Zhang, Mr H Giele, Mr J Hobby, Professor T R C Davis (Multi-Centre)

**Introduction:** Various splinting protocols may be used after surgery for Dupuytren's disease. However, a systematic review in 2008 found only four heterogeneous studies investigating splints, none of which were randomised controlled trials (RCTs). This study aimed to review current evidence in this area.

**Methods:** The Cochrane collaboration methodology was followed. Multiple databases were searched in parallel. RCTs describing post-operative splinting after the surgical management of Dupuytren's disease were included. Data were extracted and meta-analysis performed using RevMan.

**Results:** Of 2,382 search results, three described RCTs of post-operative splinting in Dupuytren's disease. One was a multi-centre UK study, one was a single centre New Zealand study and one was a two-centre Dutch study. The former two investigated three months of night splinting following surgery versus hand therapy alone. Splinting aimed to promote finger extension, and in British and New Zealand studies, splints were adjusted once surgical wounds had healed in order to maximise extension force applied. The UK and New Zealand studies were suitable for meta-analysis. All three studies found no benefit from splinting (extension deficit or hand function), and no detriment (active extension). Meta-analysis confirmed no benefit from splinting. However, meta-analysis demonstrated that active flexion was statistically significantly worse in splinted participants at three months, by 8.42°.

**Conclusions:** This meta-analysis demonstrates no benefit from aggressive post-operative splinting that promotes extension. However, such splinting significantly reduced post-operative active flexion, and so may actually be detrimental.

**15:27 Discussion**

**15:29 How important is cast application to the successful management of paediatric distal radius fractures**

Mr R Jordan, Mr G Chahal, Mr K Srinivas, Mr G Shyamalan, (Birmingham)

**Introduction:** Distal radial fractures are among the commonest skeletal injuries in childhood. For displaced fractures, closed reduction and cast immobilisation has been the mainstay of treatment but high rates of re-displacement have been reported. The aim of this study was to establish whether the cast or gap index was more successful at predicting the risk of re-displacement.

**Methods:** A retrospective analysis was carried out between September 2010 and April 2013 of all children who underwent manipulation for a distal third radius fracture. Open fractures, cases with associated dislocations and epiphyseal injuries were excluded. Initial severity of displacement was graded according to Mani et al. Intra-operative radiographs were assessed for reduction success. The first post-operative radiograph was analysed with both the cast index and gap index measured. Clinic records and post-operative radiographs were reviewed to identify any re-displacement.

**Results:** During the study period one hundred and seven patients underwent closed manipulation. There were sixty-three boys (69.9%) and the mean age of 9.3 years (range 2 to 15). Twenty-six patients (19.7%) suffered a radiographic re-displacement although only six underwent further surgery. The re-displacement group had a significantly higher gap index (0.41 versus 0.27). Although the cast index was higher in those suffering a radiographic re-displacement (0.84 versus 0.78) this did not reach statistical significance. Additional risk factors associated with a significant risk of re-displacement were initial grade of fracture displacement and a successful reduction intra-operatively.

**Conclusion:** The displacement of the initial injury, success of reduction and gap index are key factors in achieving a successful outcome.

#### 15:34 Discussion

#### 15:36 Indications, outcomes and complications of the volar rim plate for far distal radial fractures

Mr D Roberts, Mr N Vetharajan, Miss M Spiteri, Mr W Ng, Mr J Matthews, Mr D Power (Birmingham)

Far distal radial fractures are challenging as standard volar plates are designed not to be placed beyond the watershed line of the distal radius. Fractures that propagate close to the articular surface can be difficult to hold. The rim plate has been designed to be placed over the watershed line in order to capture these far distal fractures.

We analysed all fractures internally fixed over a 2.5 year period to determine the outcomes including any complications of the rim plates.

Twenty-five of 429 fractures were deemed sufficiently distal for rim plate fixation (5.8%). Twenty-one were multi-fragmentary intra-articular fractures (AO23C3) with far distal fracture fragments. A further dorsal and/or radial plate was necessary to gain control of the distal radius in eleven (44%).

The radial height, inclination and ulnar variance were restored to 11.7mm, 21° and -1.2mm, but the volar tilt was only reduced on average to 5°. This may be partly due to the need to extend the wrist to gain access to the far distal radius thereby losing reduction. Variable angle (VA) screws were used in fifteen patients (60%) to prevent joint penetration.

There were no cases of non-union or loss of reduction before union. There were also no cases of flexor irritation or rupture, however, one plate was removed for first extensor compartment irritation due to a long styloid screw. The overall incidence of metal work removal was 8%.

The use of the rim plate for extreme distal radial fractures enables control of these far distal fracture types. The use of secondary plates and variable angle screws may be required due to the difficulty gaining anatomical reduction. The risk of screw penetration must be taken into consideration given the proximity of the screws to the subchondral bone, especially if volar tilt has not been restored.

#### 15:41 Discussion

#### 15:43 Radiographic and CT correlation of Kienbock's disease - Is there a need to revisit staging with improved imaging

Mr A Mohan, Professor I Trail (Wrightington)

**Introduction and Aims:** Kienbock's disease is the avascular necrosis of the lunate which leads to a progressive collapse of the bone followed by the chronic collapse of the carpus leading to secondary arthritis of the wrist. Most commonly used classification for this condition is the Litchman classification based on radiological staging of the disease. Various imaging modalities have been described for this condition including magnetic resonance imaging and CT scanning. The aim of our study was to look at any correlations between the radiographic and CT parameters with this condition.

**Material and Methods:** In our study we looked at fifty patients with Kienbock's disease. Two independent observers looked at the radiological findings and CT findings of these patients. Radiographical parameters included carpal height ratio and ulnar variance, whereas CT parameters included any lunate fractures and height and width (W/H) ratio of the lunate.

**Results:** The correlation between carpal height ratio (X-ray) and W/H lunate (CT scan) was -0.317 with a 0.025 p-value (statistically significant). The correlation between ulnar variance (X-ray) and W/H lunate (CT scan) was -0.355 with a 0.011 p-value (statistically significant).

**Conclusions:** This suggests that CT scan could help in early prognostication and staging of this condition based on the height and width ratio of the lunate. This could also be a possible cornerstone for a CT scan based staging for this condition which could have an impact on planning treatment either reconstructive or salvage.

#### 15:48 Discussion

#### 15:50 Total DRUJ reconstruction - Experience in end stage salvage cases

Mr C S Milner, Dr L Scheker, Mr C Heras-Palou (Louisville, Derby)

**Introduction and Aims:** Current concepts regarding DRUJ biomechanics have been partnered with developments in implant design to offer a comprehensive range of solutions to DRUJ pathology, whilst respecting the joint's essential load-bearing function. In addition to standard implant sizes for DRUJ replacement, total DRUJ replacements can be custom fabricated to reconstruct the DRUJ in situations where normal anatomy has been lost and where there currently exists no alternative surgical option for DRUJ reconstruction. This paper presents a selection of situations in which the total DRUJ replacement has been used to salvage the joint following previous surgical failure, highlighting the versatility of the technique in a very challenging patient population.

**Materials and Methods:** Ten cases of DRUJ salvage using total DRUJ replacement for previous failed reconstruction are presented, including cases treated with both standard and custom fabricated implants. All patients were followed up for at least twelve months and data is presented for regained range of motion, grip strength and pain relief.

**Key Results:** All patients experienced statistically significant improvements in pain relief (4.3 to 1.1, scale 0-5), DASH scores (53.0 - 31.7 post-operatively), grip strength (8.1kg - 17 kg post-operatively), and lifting capacity (0.9kg to 5.3kg post-operatively) after total DRUJ replacement surgery. There were no cases of implant failure or sterile loosening in the included patients.

**Conclusions:** Total DRUJ reconstruction, when all else failed, was associated with major improvements in function. This demonstrates the surgical possibilities for a potentially large population of existing patients, suffering the sequelae of otherwise non-reconstructable DRUJ dysfunction.

#### 15:55 Discussion

#### 15:57 Safe guide wire and retractor positioning when performing dual cortex repair of distal biceps rupture

Mr S Roche, Ms O Flannery, Professor A Watts (Wigan)

**Background:** Although the Endobutton technique is a proven method of distal biceps rupture repair, there is an inherent risk of injury to the posterior interosseous nerve. This study looks at the safest way to position guide wires and retractors when using this technique.

**Methods:** Guide wires and retractors were placed in different positions within and around the biceps tuberosity in fresh frozen cadaveric upper limbs to determine their proximity to the posterior interosseous nerve (PIN).

**Results:** Guide wires placed in the distal half of the biceps tuberosity and angulated radially were most likely to injure the PIN. All retractors placed on the radial side of the bicipital tuberosity either compressed or displaced the PIN. Ulnarly placed retractors did not put the PIN at risk of injury.

**Conclusion:** Careful placement of guide wires within the proximal half of the bicipital tuberosity in a line perpendicular to the surface of the arm table with the forearm in maximum supination reduces the risk of morbidity to the PIN. The use of retractors on the radial border of the bicipital tuberosity should be avoided.

16:02 Discussion

16:04 Does the URAM score correlate with the Tubiana score in patients with Dupuytren's presenting for treatment

Mr A Salibi, Mr M Venus, Mr C Bainbridge (Derby)

**Introduction and Aims:** The Tubiana scale is a commonly used method for assessing the severity of Dupuytren's contracture. The URAM scale is a patient-reported measure of hand function for use in patients with Dupuytren's disease. It has been validated against the Tubiana score in the French literature and scores tend to improve in patients who have undergone needle aponeurotomy. The URAM has quickly gained acceptance as a simple tool for assessing the severity of Dupuytren's contracture but has not been validated in the English language. We aim to assess whether a true correlation exist between these two methods in patients undergoing needle aponeurotomy (NA).

**Material and Methods:** Patients presenting for NA pre-operatively were asked to complete the URAM questionnaire for the hand that was treated. The extension deficits for each treated finger were measured using an electronic goniometer, and staged according to Tubiana scale. The total scores were compared using Pearson's correlation coefficient.

**Results:** Sixty-nine patients were recruited over an eight-month period. A total of ninety-four affected hands were assessed using the two scales. URAM scores ranged from 0 to 34 (mean= 13.3) and total Tubiana scores ranged from 0 to 14 (mean= 5) for each hand. A comparison of the URAM and total Tubiana scores using Pearson's correlation coefficient gave a score of  $r= 0.3$  ( $p= 0.0006$ ) indicating poor correlation.

**Conclusion:** The URAM cannot be recommended as a valid assessment of Dupuytren's severity when compared to objective data, and we do not believe that it should form the basis for an assessment of suitability for surgery. We are now proceeding to an audit of the change in URAM before and after NA to assess if it can be correlated with change in Tubiana score.

16:09 Discussion

16:15 Close of meeting

- 1 **The logistics and challenges of instituting patient reported outcome measures as part of routine clinical practice: The Sheffield Hand Centre experience**  
Miss K Sharma, Miss K Steele, Mr G Miller, Miss M Birks (Sheffield)

Patient reported outcome measures (PROMs) allow us to comprehend how our services impact on patients' lives, from their point of view. Typically a validated questionnaire is administered before and after treatment in order to quantify a change in health. The government advocates the use of PROMs as part of their vision to keep patients and the public informed in the modern NHS.

PROMs are extensively used in clinical trials and have more recently been utilised as part of routine clinical practice by countries including the USA and Australia. Generally permanent research staff is involved in managing the process. However the financial constraints of the NHS have prompted us to develop a more self-sufficient system, requiring minimum time input from medical and administrative staff in terms of data collection, analysis and interpretation.

We describe our technique, which was instituted over a four-year period to develop the routine collection of PROMs data in a regional hand unit. The key aspects of the set up included a cohesive multi-disciplinary team and collaboration with a software company that allowed us to develop a tablet-based application, PROMappS (Patient Reported Outcome Measure application Sheffield), in order to achieve paperless data collection. We aim to highlight the challenges encountered, which included financial and technical in addition to engaging medical and administrative staff, patients and carers.

Undoubtedly this practice will generate a wealth of robust data that can be used for benchmarking within the region, to concentrate services and to aid in revalidation, now essential for clinicians at all stages.

- 2 **Audit of hand X-ray adequacy: Are you happy with your X-ray?**  
Mr H Taki, Mr M Nassimzadeh, Mr Z Ahmed, Mr R Jose (Birmingham)

**Aims:** It became apparent in our daily hand trauma unit that a significant proportion of the radiographs reviewed were not ideal. We set out to audit the adequacy of our department's hand and finger X-rays.

**Methods:** After consulting our radiographers, we found there was no universal departmental guidance on hand and finger X-rays. We used the radiography textbook, Clark's Positioning in Radiography, to devise standards for our audit. We audited the last one hundred X-rays over five consecutive days against the standards taken from this text. Two doctors reviewed all the images in order to agree their adequacy. Results were reviewed and guidelines written and distributed to the radiography department to help standardise practice. The audit was repeated three months later without informing the department, again looking at another one hundred X-rays.

**Results:** We reviewed forty-six hand X-rays, 11 thumbs and 43 fingers. 25% of these radiographs were inadequate. The most common causes were laterally rotated finger X-rays and laterally rotated hand X-rays. There were two cases of patients being imaged with their jewellery still on and an inadequate oblique film. Upon repeating the audit three months later following guideline distribution, we showed a significant reduction in inadequate X-rays from 25% to 10%.

**Conclusion:** To improve our adequacy, we circulated clear guidelines on how to position patients for adequate hand X-rays. We have noticed that the radiographs reviewed at our trauma meeting have improved in quality. This highlights the importance of audit to improve clinical practice and ultimately reduce delays in treatment, as well as the importance of communication of what surgeons need clinically and setting guidelines.

**3 Closed bilateral flexor pollicis longus ruptures at the musculotendinous junction: A case report and literature review**

Mr K Y Wong, Mr A Qureshi, Mr G Cormack, Mr P Gillespie (Cambridge)

**Introduction:** Closed flexor tendon ruptures of the hand are uncommon and rare in the absence of underlying disease or trauma. We report a case of closed bilateral flexor pollicis longus (FPL) rupture at the musculotendinous junction and review the literature.

**Case Presentation:** A fit and well 34-year-old male laundry worker presented with a two week history of inability to flex his non-dominant left thumb at the interphalangeal joint. He was a non-smoker and there was no history of injury or previous fractures. Ultrasound showed an FPL musculotendinous junction rupture. This was surgically treated with a ring finger flexor digitorum superficialis tendon transfer. He had full return of thumb flexion and hand function. Three years later he presented with a similar history affecting his dominant thumb, again with no obvious aetiology. Ultrasound confirmed another FPL musculotendinous junction rupture and he was offered another tendon transfer but declined surgery.

**Discussion and Conclusion:** When normal muscle-tendon units are subjected to excessive force, they rupture at their bony insertion or musculotendinous junction. Closed flexor tendon ruptures at the musculotendinous junction are however rare, with only a few reported cases and little literature on the subject. They are difficult to repair directly and tendon transfer remains the best surgical option.

Our case presentation suggests multifactorial aetiology including repetitive microtrauma and genetic influences. There is limited literature regarding the latter but studies have suggested that various genes such as tenascin C, collagen V alpha 1 and matrix metalloproteinase 3 may be involved with musculotendinous injuries.

**4 Case Report: Feeling the blues - A surgical cure**

Mr A Woollard, Mr L Murugesan, Mr G McArthur (London)

**Introduction:** Musicians are unique patients. Recognition of a compression neuropathy in a professional musician and its appropriate management can dictate whether the artistry can be replicated at the highest level. We describe a rare case of cubital tunnel syndrome in a professional trombonist where hand surgery meets the performing arts and highlight the importance of an accurate consultation.

**Case Report:** A 31-year-old professional trombone player was referred to the plastic surgery department with a left ring finger phalangeal fracture. He had been a brass instrumentalist for ten years, had no previous upper limb trauma and did not have any other significant medical history. Upon examination, marked first web space wasting and a positive Tinel test on ulnar nerve percussion were noted as incidental findings. The subject subsequently revealed a history of weakness in holding the trombone, occasional paraesthesia in the ulnar distribution that affected his performance but he did not seek medical opinion. Nerve conduction studies confirmed moderately severe left cubital tunnel syndrome. The nerve was found to be compressed and hyperaemic after the tunnel release. A subcutaneous anterior transposition of the nerve was performed. Post-operative follow-up demonstrated an improvement in strength and the patient was able to play more comfortably.

**Discussion:** This case highlights the importance of careful history taking and thorough examination with appreciation of the specific demands of various professions. Signs may otherwise be easily missed with potentially devastating sequelae. In this case, recognition of the entrapment neuropathy halted further nerve damage and potentially prevented an early career change à la Schumann.

**5 Subungual squamous cell carcinoma: A case report and literature review**  
Mr K Y Wong, Mr D Ching, Mr D Gateley (London)

**Introduction:** Subungual squamous cell carcinoma (SCC) is rare and can mimic a range of other pathological conditions. We present a case of subungual SCC with invasion into the underlying bone and review the literature.

**Case Presentation:** A 52-year-old male presented with a six-week history of increasing pain at the tip of his left non-dominant thumb. He denied any trauma to the digit. On examination, there were no signs of infection, inflammation or skin changes. He had normal movements and mild discomfort at the tip of his left thumb on palpation. The patient was subsequently discharged with analgesia.

A month later he presented with the same persistent symptoms. Apart from mild swelling of his left thumb tip there were no other abnormalities. An X-ray of his left thumb showed a lucency of the distal phalanx and a bone biopsy was arranged to rule out a glomus tumour. The histology showed fragments of a well-differentiated invasive SCC together with fragment of bone. He subsequently had an amputation through the interphalangeal joint.

**Discussion and Conclusion:** Subungual SCCs often present with non-specific features, which can mimic other conditions. Other differential diagnoses for an erosive lesion of the distal phalanx include glomus tumour, giant cell tendon sheath tumour, subungual keratoacanthoma and mucous cyst.

It is important to consider malignancy in the presence of persistent symptoms that are unresponsive to treatment to prevent delayed diagnosis and progression of disease. Ultimately, a biopsy is required for diagnosis and to guide subsequent management.

**6 Flexor carpi radialis tendon rupture as a delayed consequence of distal radius fracture: A case report**  
Mr J Duncumb, Mr P Johnston (Cambridge)

Tendon rupture as a delayed consequence of distal radius fracture is rare. This occurs in less than 1% of cases with the majority involving extensor tendons or the pollicis tendons. We report the third known case of flexor carpi radialis tendon rupture secondary to wrist fracture in a 59-year-old male. During surgical management of the wrist fracture, we encountered the frayed ends of the tendon overlying a volar bony spur. Unlike the other reported cases, we did not perform a repair of the flexor carpi radialis tendon as it was not clinically indicated. Re-joining the tendon by primary repair or grafting carries the risk of adhesions and subsequent stiffness of the hand. The radius was realigned with a locking distal volar plate and cast. At five months follow-up, the patient demonstrates no pain or limitations regarding power or function. We suggest that repair of the FCR tendon is not indicated in all cases of tendon rupture associated with wrist fracture unless the patient presents with functional symptoms.

**7 Case report: Never say never and remember to act fast**  
Miss P Chadha, Miss H Lloyd-Hughes, Mr T Halsey (London)

Acute limb compartment syndrome is a limb threatening, and occasionally life threatening, emergency that requires prompt recognition and treatment. Consequences can range from muscle necrosis and limb amputation to renal failure and death. Damage of an artery following closed injury has previously been well documented in the literature, following a fracture of the proximal long bones and dislocations of the knee and elbow. However, complete rupture of the ulnar artery, in the absence of a forearm fracture, leading to compartment syndrome has not been documented.

A six-year-old male presented with his mother three hours after a crush injury to his right arm. His forearm was acutely swollen and painful. No abrasions or skin lacerations were sustained.

On examination, the radial pulse was palpable and capillary refill at the fingertips was two seconds. All attempts at active and passive movement were resisted due to pain, which was uncontrolled despite opiate analgesia. Peripheral sensation in the median nerve distribution was reduced. Radiographs showed no fractures.

An urgent upper limb fasciotomy was performed. A large haematoma was found, which extended volarly and dorsally. Further exploration confirmed a patent radial artery but complete rupture of the ulnar artery.

Previous damage to the radial or ulnar arteries in the forearm is common following lacerations and open fractures. Rupture of the ulnar artery in the absence of a laceration or any fracture leading to compartment syndrome has not, to our knowledge, been reported previously. Although this mechanism of injury could seem to be an unlikely cause of arterial rupture, early consideration of the diagnosis and prompt surgical management is essential.

**8 Superficial angiomyxoma: A rare tumour of the hand**

Miss N Patel, Mr G Titley (Birmingham)

Superficial angiomyxoma is a rare and poorly recognised cutaneous tumour. First described by Allen et al in 1988, it is a benign tumour of the dermis and subcutaneous tissue, usually presenting as a nodular, well circumscribed lesion. Superficial angiomyxoma more commonly affects the trunk, lower extremities, head and genital regions, and has a high recurrence rate. There have been only a few reported cases of lesions affecting the upper limb, more specifically these have been subungual or digital lesions.

We present a case of a forty-year-old woman with a six-month history of a rapidly growing, well circumscribed, subcutaneous lump on the palmar surface of her hand. MRI showed a well-defined lesion arising from the flexor sheath, with no invasion of surrounding structures. USS guided biopsy revealed a myxoid lesion. Following surgical excision, histological diagnosis of angiomyxoma was made.

Superficial angiomyxoma is a rare benign tumour. To our knowledge, this is the only case described affecting the palm. We would like to highlight the clinical dilemma this case posed when presented with a lesion behaving similarly to a malignant tumour.

**9 Reconstructive versus salvage procedures for scaphoid non-union advanced collapse: A case report and literature review**

Mr K Y Wong, Mr P Johnston (Cambridge)

**Introduction:** Non-union of scaphoid fractures are reported to occur in about 10% of cases. Scaphoid non-union affects wrist joint function and is often associated with a predictable pattern of degenerative change, more specifically, scaphoid non-union advanced collapse (SNAC). Various management options are available. We review the literature and present the management and outcomes of a fifteen-year-old scaphoid fracture with SNAC.

**Case Presentation:** A thirty-year-old male presented with a symptomatic fifteen-year-old right scaphoid fracture with secondary SNAC of his right wrist as shown on MRI. There was no evidence of avascular necrosis. The initial injury was from a fall onto his outstretched hand. He was aware of the scaphoid fracture but it was treated non-operatively at the time. We discussed the management options with the patient and the potential need for salvage surgery if primary intervention failed. We performed a right scaphoid open reduction, internal fixation and iliac crest bone graft. One year after the operation the patient had good wrist function and excellent grip strength. A CT scan showed union of the fracture.

**Conclusion:** Studies have shown that if the time between initial fracture and treatment of non-union exceeds five years, the chances of healing of the non-union are markedly reduced. In our case, despite the long duration between timing of injury and surgery, there was union and good

return of function. This is a difficult patient group and reconstruction should be considered before salvage procedures such as proximal row carpectomy and wrist fusion.

- 10 Osteoid osteoma of the phalanx in children: A case report and literature review**  
Dr M Ben Jemaa, Professor W Zribi, Dr A Naceur, Professor M Zribi, Professor H Keskes (Sfax, Tunisia)

The osteoid osteoma is a benign bone tumour. It affects specially long bones. Its phalangeal location is rare and represents a challenging diagnosis. Through a case of an osteoid osteoma of the index finger in a child and literature review, we analyse the clinical and para-clinical features of this rare location, differential diagnosis and various treatment options.

We report the case of an eleven-year-old boy who presented with pain in the right index finger since the age of one, with nocturnal exacerbation. A history of benign trauma was reported. Clinical examination noted a hypertrophy of the third phalange of the painful finger without redness or local heat. X-rays showed a rounded and well-limited osteo-condensation centred by puncture clarity in the third phalanx. An open sky resection after radiological location was undergone. Anatomopathological examination concluded in an osteoid osteoma.

Complete relief of the pain immediately after surgery was obtained and no recurrence was described after one year of follow-up.

The osteoid osteoma is a benign bone tumour characterised by its particular pain symptoms and slow evolutionary potential. Its location in the hand is rare and accounts for 5%. It is characterised by a typical radiographic image. Modern imaging modalities and bone scintigraphy are useful if the nidus is not identified. Whatever the therapeutic technique used, only the complete resection of the nidus provides complete relief of pain and prevents recurrences.

- 11 A case report: Spontaneous haematoma in the hand mimicking carpal tunnel syndrome**  
Miss P Chadha, Mr M Wordsworth, Miss J Ruston, Miss G Smith, Mr R Eckersley (London)

A well-known complication of warfarin is spontaneous bleeding when the INR is inappropriately high. Documentation of a spontaneous haematoma in the colon, spine and even rectus sheath can be found in the literature. However, to our knowledge, spontaneous haematoma into the carpal tunnel, palmar aponeurosis and flexor sheath leading to compression of the median nerve and ulnar nerves, is not currently documented.

We present the case of a 49-year-old Afro-Caribbean gentleman who presented to our accident and emergency department with a sudden, atraumatic onset of pain in the right hand. On examination, the patient had a bruise delineating the palmar aponeurosis on the volar aspect of his right hand. His fingers had a capillary refill time of less than two seconds but he was unable to close his fist fully due to pain and swelling. He had altered peripheral sensation to his index, middle, ring and little fingers and Tinel's test was positive.

The patient was on warfarin for previous DVTs and was found to have an INR value of 4.0. An ultrasound scan of the wrist showed diffuse haematoma of the right palm with a thickened palmar aponeurosis.

The patient was treated conservatively with elevation and his warfarin medication was stopped temporarily. His symptoms resolved over 48 hours.

Spontaneous haematoma into the carpal tunnel and palmar aponeurosis causing median and ulnar nerve symptoms has not been previously documented in the literature. Ultrasound scan is a cost effective and non-invasive method of diagnosing this condition and often non-surgical management can resolve an isolated episode.

- 12 **Parent-reported outcome measures (PROMs) for surgery in congenital trigger thumbs: Development and initial validation of a new questionnaire**  
Miss Y R Chin, Miss J Mennie, Mr W L Lam (Edinburgh)

**Introduction and Aims:** Congenital trigger thumb (CTT) is a flexion deformity of the thumb interphalangeal joint caused by abnormalities at A1 pulley. To date, there is no psychometrically validated tool developed to assess parent-based outcomes and psychosocial impact of CTT in children or their parents. The aim of this study was to develop and pilot test a new parent-reported outcome measure (PROMs) following CTT surgical release based on appearance, socialisation and function.

**Material and Methods:** Following national guidelines for PROMs development, phase one of the study involved generating items about the health impact of CTT, as generated from literature review, expert opinions and qualitative parent interviews. Pre- and post-operative questionnaires were then administered retrospectively to ten parents. Standard psychometric methods were used for item-reduction (phase 2) based on the responses.

**Results:** The response rate was 80% ( $n=8$ ). Out of a maximum score of 45, 35 and 95 in appearance, social and function respectively, parents reported statistically significant improvement ( $p < 0.05$ ) in post-operative scores for social [27.1-32.4 (19.5%)] and function [78.9-90.4 (14.6%)] but by far the greatest improvement was in appearance [24.4-40.7 (66.5%)]. This may highlight many parents' perception of CTT as predominantly a cosmetic deformity.

**Conclusion(s):** This is the first PROMs to demonstrate an improvement in post-operative outcome. The results provided good insight into the bio-psychosocial aspects of parents of children with CTT. With increased emphasis on the use of PROMs for healthcare funding, these condition-specific PROMs could be a useful addition to the value of congenital hand surgery for 'minor' hand conditions.

- 13 **Case report: A rare presentation of synechium of a finger and palm as a result of severe recurrent Dupuytren's contracture**  
Mr A Allouni, Mr W Bhat, Mr P Longhi (Durham)

**Introduction and Aims:** Dupuytren's disease is a benign fibromatosis of the palmar and digital fascia. It is caused by a pathologic palmar fascia that contracts and pulls the fingers into the palm. The surgical procedure performed to treat the disease does not affect the recurrence rate except for dermofasciectomy, where recurrence rate is lower. The authors report a rare case of recurrent Dupuytren's contracture presenting with synechium between the distal phalanx and the palm.

**Material and Methods:** We are presenting a case of an 81-year-old female patient. She has been suffering from bilateral Dupuytren's contracture for thirteen years. She underwent a fasciectomy operation for the treatment of her Dupuytren's contracture of her left little finger. She was seen later in our clinic with complete synechium of her little finger that has developed over six months. The patient is not known to have diabetes mellitus, history of trauma or any other upper limb diseases.

**Results:** She denied any history of trauma and has no other upper limb diseases. The patient underwent an operation for amputation of her finger and the histology confirmed the diagnosis of recurrent Dupuytren's disease. One might hypothesise that a trivial trauma to the skin caused an acceleration of the excess deposition of type III collagen and the formation of cross-links between myofibroblasts and collagen.

**Conclusion(s):** The patient was complicated with severe recurrence of the disease. Recurrence of Dupuytren's contracture is a well-known complication which might cause unwarranted complications that are not yet described in the literature.

**14 Pathoanatomy of the Boutonniere deformity: A cadaveric study of the relationships between the components of the extensor mechanism at the proximal interphalangeal joint and its implications for management and rehabilitation**

Dr R Al-Ahmed, Mr W L Lam (Edinburgh)

**Introduction:** Central slip injuries are commonly missed, with delayed diagnoses leading to development of the Boutonniere deformity. Although its pathoanatomy is well described, the exact relationships and parameters of each extensor component at the proximal interphalangeal joint (PIPJ) have never been studied in detail. The aim of this study is to delineate the dynamic relationships between the central slip (CS), triangular ligament (TL) and lateral bands (LB) at the PIPJ.

**Methods:** Twenty fresh frozen fingers are dissected. After division of the CS, the TL is released to allow stretching while each finger is flexed fifty times. Finally, connections between the LBs and CS are released incrementally to facilitate volar subluxation and eventual deformity.

**Results:** Average distance of the TL base before division is 0.47 (0.4-0.7cm). After division, there is an immediate retraction of the CS, although insufficient to cause any deformity. With increasing LB/CS division at 0.5, 1 and 1.5cm intervals, the CS retracts steadily at 0.2cm intervals, with a corresponding widening in the TL base of 0.1cm intervals. When the LB/CS division reaches 1.5cm, a sudden increase in CS retraction occurs with concomitant development of a Boutonniere deformity. Overall, CS retraction distance averages 129.67% (83-214%) when measured from insertion point to PIPJ.

**Conclusions:** These consistent parameters provide a useful guide when predicting the imminent development of a Boutonniere deformity. With imaging techniques like ultrasound, knowledge of the CS/TL distances may guide the effectiveness of conservative treatment or timing for surgical intervention, as well as the length of graft needed to reconstruct the central slip and correct the deformity.

**15 Reconstruction of the upper limb in tetraplegia**

Mr D Roberts, Miss M Spiteri, Mr T Heywood, Mr D Power (Birmingham)

**Introduction:** Nerve transfer surgery may offer an alternative option for incomplete tetraplegia patients but early reconstruction within six months is essential. This requires a change in practice with education, early referral, targeted EMG assessment and review by a hand surgeon with a specialist interest in nerve transfer surgery.

**Methods:** Current UK practice and opinions on reconstructive surgery strategy was reviewed with a survey of full BSSH consultant members in April 2014.

**Results:** The survey had a 20% response rate with a good geographical spread representing all eleven UK rehabilitation centres. 75% of respondents were from an orthopaedic background and 80% devoted at least 75% of their time to hand surgery. 12% of respondents were aware of local referral pathways for tetraplegia reconstruction. 31% of respondents had assessed tetraplegic patients in the last twelve months with 80% seeing fewer than five new referrals. However only ten respondents undertook tetraplegic upper limb reconstruction and only two undertook more than five cases per annum. 7% of respondents suggested that nerve transfer was the optimum way of restoring elbow extension in a C6 level tetraplegia, whilst 23% favoured biceps to triceps transfer and 21% deltoid transfer although none were undertaking the nerve transfer procedure. Only one respondent believed that restoration of tripod grip was possible in an O IC 1 triceps injury.

**Conclusion:** Early referral for reconstructive surgery is essential for consideration for nerve transfer surgery. Provision of specialist reconstructive surgery is inconsistent in the UK. The authors propose a BSSH sponsored review of referral guidelines, reconstructive strategy and standardisation of outcomes assessment in this complex patient group.

**16 Single-stage combined surgery for Kienbock’s disease and scapholunate dissociation - A case report**

Miss H L Stark, Surg Lt Cdr C Fries, Mr J Henderson, Mr S Lee (Bristol)

**Introduction:** Kienbock’s disease and scapholunate dissociation are relatively rare conditions with significant functional implications, especially if affecting a patient’s employability.

**Case:** A self-employed market gardener presented with both pathologies in his dominant wrist. Whilst highly motivated, his business circumstances precluded two periods of rehabilitation associated with staged reconstructive surgery. He was treated with a single stage procedure which we believe has not previously been described.

**Methods:** A 48-year-old man presented with chronic wrist pain after repeated injuries. He had “worked through” increasing levels of pain, but this had become intolerable and he was unable to work. The simultaneous diagnoses of Kienbock’s disease and scapholunate dissociation were made in the context of ulnar minus variance.

The following operation was performed:

1. A radial shortening osteotomy.
2. The necrotic lunate was drilled out and reconstructed with a free vascularised bone graft from the medial femoral condyle.
3. The scaphoid was reduced and K-wired to the radius. A Brunelli procedure was performed using a flexor carpi radialis sling through the scaphoid and anchored to the distal radius.

**Results:** Procedure design is complicated by the concomitant effect of each condition on the management of the other. The authors’ preferred method of holding the reduced scaphoid to the lunate with K-wires cannot be performed in this context. After four months the patient reports a return to normal function and employment. He has a pain-free stable wrist joint with good mobility and no collapse.

**Conclusion:** A single-stage procedure for this combined pathology may be appropriate in motivated patients with high functional demands.

**17 An audit of referral practice for upper limb reconstruction following incomplete tetraplegia**

Mr D Roberts, Miss M Spiteri, Mr T Heywood, Mr D Power (Birmingham)

**Introduction:** Rehabilitation in a specialist centre is mandatory following spinal cord injury. A stay of around six months is typical for the incomplete tetraplegia patient. Referrals for upper limb reconstruction are dependent on rehabilitation specialists, physiotherapists, hand therapists and hand surgeons. Tendon transfers may be contemplated after one year but not all patients are offered intervention and uptake by patients is variable.

**Methods:** An audit of all patients referred and treated in a specialist upper limb reconstructive surgery service at a national spinal cord injury rehabilitation centre was undertaken to establish current practice.

**Results:** An audit of new spinal injury admissions at Stoke Mandeville demonstrated 337 cases between 2010 and 2012 with 227 (67%) traumatic and 25% of these incomplete being suitable for upper limb reconstruction. These figures would conservatively predict twenty-eight new referrals per annum. Over a ten-year period only 146 patients were referred for an opinion. Ninety-two were offered tendon transfer surgery with 44% proceeding. There were twenty-one deltoid to triceps transfers and 19 achieved MRC 3-4. Twenty-six BR to FPL transfers were performed for key pinch and 24 attained useful grip. There were nine palmar grip ECRL to FDP transfers and all achieved useful function. No nerve transfers were performed over this timeframe.

**Conclusion:** Current referral practice is lower than would be predicted by review of spinal injury admissions for rehabilitation. The authors propose a BSSH sponsored review of referral guide-

lines, reconstructive strategy and standardisation of outcomes assessment in this complex patient group.

**18 The rare entity of palmaris profundus and a bifid median nerve: A case report**  
Mr M Sidhu, Miss N Patel, Mr G Titley (Birmingham)

Palmaris profundus, initially described in the literature as a variant of palmaris longus, is now respected as a separate entity. It is an aberrant muscle with a course closely related to the median nerve.

Of all anomalous muscles described within the carpal tunnel, the presence of palmaris longus is the one most commonly found to be compressing the median nerve.

We observed a rare variation in relation to the median nerve within the carpal tunnel of a 42-year-old female during a median nerve exploration. The palmaris profundus tendon was seen to pass through a bifid median nerve within the carpal tunnel. This muscle originated in the distal forearm, and its tendon passed through the median nerve before inserting on the deep surface of the palmar aponeurosis.

Given the rarity of this entity, we feel this variation highlights an interesting anomaly which clinicians should be aware of when considering patients for carpal tunnel surgery.

**19 Parsonage-Turner syndrome - A clinico-epidemiological study from the hand surgeon's perspective**

Mr C S Milner, Dr S Thirkannad, Dr K Kannan, Professor V Iyer (Louisville)

**Introduction and Aims:** Parsonage-Turner syndrome (PTS) is a rare but serious condition characterised by spontaneous shoulder pain preceding paresis of the upper extremity, typically lasting months and with a variable recovery. This work sought to address the paucity of literature on the natural history of PTS from a hand surgeon's perspective, such that patients presenting with the condition are both correctly diagnosed and are able to receive accurate information as to what to expect in management and likely clinical course.

**Materials and Methods:** Retrospective evaluation of all PTS patients presenting to our hand unit over a nine-year period. Data was collected for sex, side affected, handedness, inciting event, clinical presentation, nerve involvement, time taken for recovery and extent of recovery.

**Key Results:** Thirty-eight adult cases of PTS were identified; 55% were female, with greater right handedness and dominant upper extremity involvement (60% and 58% respectively). There was an inciting incident in 42% of cases and 37% of these cases involved surgery. 29% of cases presented without experiencing typical neuropathic pain, with a predomination of anterior or posterior interosseous nerve involvement (42% overall). 44% of patients achieved a complete recovery, taking a mean duration of ten months.

**Conclusions:** This study highlights the atypical spectrum of clinical presentation in PTS, especially considering the more common involvement found for the AIN & PIN. This highlights the likelihood that patients presenting with PTS to a hand surgical practice may differ from those typically described in literature. The poor rate of recovery is in line with other recent reports and contrasts with the more positive outcomes found in earlier studies.

**20 The 'Bamboo Hand' - An innovative training model for hand fracture fixation**  
Mr J Coelho, Mr S Majumder (Wakefield)

**Introduction:** Simulation training for hand fracture fixation commonly utilises expensive prosthetic hand models made from material such as solid rigid polyurethane foam. Although these models may look anatomically accurate, they lack important textural properties of human bone. The foam bone is relatively soft and there is no medullary cavity, thus the important cortex-medulla interface is absent.

**Material and Methods:** Using a wooden jig with five digits of regular garden bamboo. K-wire, lagging and plating of metacarpal and phalangeal fractures can be practiced.

**Results:** The “Bamboo Hand” allows the trainee to drill and K-wire through two tactile cortices, with a central medulla. In addition to this it mimics bone by heating and burning with friction, the drill will slide off the cortex if not correctly supported and will crack if drilled too close to the fracture edge. The natural different shapes of bamboo allow the trainee to shape plates to fit, mimicking head, neck, shaft and base fractures. Wrapping the bamboo digits with sponge dressing adds the extra layer of skin, forming a realistic model for percutaneous K-wiring. Furthermore the bamboo cortices are radiopaque. The wooden jig allows new pieces of bamboo to be easily inserted and secured, making the training model extremely cost effective.

**Conclusion:** We demonstrate an innovative training model that has never been previously described for hand fracture fixation.

## 21 Autologous fat grafting in hands

Mr O Bassett, Miss H Lloyd-Hughes, Miss P Chadha, Mr A Pabari, Mr A Mosahebi (London)

**Introduction:** The aged hand develops thinning of the skin with increased laxity and generalised dorsal subcutaneous atrophy, leading to prominence of extensor tendons and subcutaneous veins. Various methods of rejuvenation have been described, however autologous fat grafting is becoming increasingly popular. It can increase volume but also the quality and appearance of the skin. We aim to critically appraise the available evidence for fat grafting as a treatment for hand rejuvenation.

**Methods:** We searched the PUBMED database using the MeSH terms: adipocyte, autologous fat graft, hand, rejuvenation, adipose derived stem cells. All articles in English, published up until June 2014, were included. Reference lists of included articles were also searched for further relevant publications.

**Results:** One hundred and forty-six articles were reviewed. Details of harvesting technique, centrifugation, re-injection methods, volume assessment and outcome and incidence of complications were recorded.

**Conclusions:** Despite increasing popularity there is a limited amount of published material on the use of autologous fat grafting in rejuvenation of aging hands. We report the current evidence and use this to create a treatment framework including harvesting and processing techniques and injection methods.

## 22 Uses for Botulinum toxin in hand surgery

Mr S Nicholson, Mr S Southern (Wakefield)

**Introduction:** Since Botulinum neurotoxin (BNT) was first used medically in the 1980s many indications for its use have been devised. We summarise the variety of uses for BNT in hand surgery, including dose and administration details and the efficacy of each treatment.

**Musculoskeletal:** BNT induces temporary but irreversible paralysis of skeletal muscle. This has been utilised in the treatment of upper limb spasticity to improve function and hygiene, and reduce the risk of complications of increased muscle tone. BNT has been used for the treatment of chronic lateral epicondylitis and a recent meta-analysis supports its use in cases resistant to other treatments. BNT has also been used to decrease the force of forearm flexor muscle contraction following flexor tendon repair, to reduce the risk of rupture.

**Nerve:** Botulinum toxin can provide a direct analgesic effect without interference with muscle function. This antinociceptive effect is thought to relate to its interference with neurotransmitters including substance P and glutamate. Several RCTs have demonstrated improvements in pain,

function and quality of life in chronic arthritis and complex regional pain syndrome affecting the upper limb. Injections have also reduced pain in patients with carpal tunnel syndrome.

**Vessel:** Several studies have demonstrated improvements in symptoms and hand function in patients with vasospastic disorders such as Raynaud's syndrome treated with BNT. Improved healing of digital ulceration in such patients has been noted.

**Summary:** Uses for Botulinum toxin in hand surgery are increasing in number, and as the evidence base grows, it is likely that more surgeons will incorporate it into their treatment repertoire. Knowledge of the efficacy of BNT for each treatment indication is essential for patient information and ensuring expectations are met.

**23 Thermographic imaging to show improved vascularity after Botulinum toxin type A (Botox) injection for Raynaud's phenomenon**

Mr D Roberts, Miss E Breuning, Mr D Power (Birmingham)

Raynaud's phenomenon is a vasospastic disorder affecting the digital and palmar vessels. It has been reported that injecting Botulinum toxin type A (Botox) into the hand can improve circulation and aid in the healing of fingertip ulceration. There have been no studies to date in the literature using thermographic imaging to show temperature change in the digits in response to Botox injection.

Thermographic imaging, also known as infrared thermography, is routinely available in the medical illustration department at our institution. It works by detecting naturally emitted infrared energy from the skin, which varies according to the dermal temperature. Thermographic pictures were taken before and after Botox injection at the point of bifurcation of the digital arteries in the palm. These have shown a marked difference in the temperature of the digits when controlling for other confounding factors, including ambient temperature. One patient also noted healing of chronic ulceration in the tip of the index finger, reinforcing the benefits of Botox displayed in previous studies.

Thermographic imaging is therefore a useful clinical tool to visually document blood flow in the extremities and analyse the response to Botox injection in the hand. We also propose this method of analysing perfusion for other modalities including the vascularity of flaps, perfusion of replanted digits, and in diagnosis of certain conditions, e.g. hand-arm vibration syndrome.

**24 Point of technique: The 'pole and tent' pressure dressing**

Mr A Salibi, Mr A Barabas (Derby)

**Introduction:** Pressure from circumferential compression bandages to control arterial or venous haemorrhage following trauma to the upper extremity frequently results in venous congestion or even ischemia to the limb beyond the bandage. We describe a very simple, cheap and a reliable method of pressure dressing that eliminates the risk of venous congestion or ischaemia.

**Technique:** A standard non-adherent dressing is first applied to the wound. Two rolls of a standard "stretch" bandage, such as K-Band, are required. The first roll is applied unrolled along its longitudinal axis with one end pressing directly over the wound, acting as a "pole". The second bandage is wrapped around the limb, over the top of the "pole", such that perpendicular pressure is applied through the "pole" onto this wound.

**Conclusion:** This applies the greatest pressure directly under the "pole" onto the wound, such that the circumferential element of the bandage does not have to be so tight as to cause ischemia, but will prevent further haemorrhage. The "pole" also lifts the second bandage to either side of the "pole" completely away from the skin, creating the appearance of a tent. This prevents delayed congestion of the distal extremity as it allows for venous drainage.

### 25 Tuberculosis of the wrist: A case report and literature review

Dr M Ben Jemaa, Professor W Zribi, Dr A Naceur, Professor M Zribi, Professor H Keskes (Sfax, Tunisia)

Tuberculosis is an infectious disease which represents a public health problem. Osteo-articular involvement is rare. Although its location in the wrist is exceptional it should always be considered in case of chronic pain, especially in endemic countries such as Tunisia.

We report the case of a 22-year-old man from an urban environment, who presented with a chief complaint of a painful and inflammatory right wrist, which developed three months ago after benign trauma. The general condition was good. The mantoux test was positive. Laboratory tests showed an inflammatory syndrome without hyperleukocytosis. X-rays identified a destructive osteo-articular involvement which has been well analysed by magnetic resonance imaging. Surgical drainage and immobilisation by external fixation were done. A surgical biopsy confirmed the tuberculous origin, showing a giant cell granuloma with caseous necrosis and indicating the initiation of a specific anti-tuberculosis treatment.

After one year of follow-up, the patient healed but the radiologic image persisted. Clinically, a useful function of the wrist was recovered. A discrete stiffness persisted.

Tuberculosis of the wrist is a rare location of the disease. It usually follows an osteitis of the radius or the carpal bones. It may be secondary to flexor tenosynovitis. The clinical presentation is characterised by a painful wrist mobilisation, then by a dorsal swelling. A carpal tunnel syndrome was described. The pain and swelling are the major signs. X-rays show a bone and joint destruction at advanced stages. Despite the medical and surgical treatment adapted bacteriological sterilisation is achieved at the cost of persistent clinical sequelae and a disabling stiffness.

# 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 funding. If all funding for the year has been utilised, full registration fees must be paid.

## Registration Fees

BSSH Full Members and Associates who are Consultants	£320 Whole meeting £160 One day
IHSS Members	£320 Whole meeting £160 One day
BSSH Associates who are Trainees, Companion Members	£195 Whole meeting £100 One day
BSSH Honorary and Senior Members	£40 per day
Trainee Non-members	£240 Whole meeting £125 One day
Other Non-members	£420 Whole meeting £210 One day
Speakers who are Research Doctors or Scientists	£40 per day

On-site registration does not include a ticket to the Society Dinner.

## Registration and Enquiry Desk

The Registration and Enquiry Desk (situated in the Foyer on the ground floor of the Royal College of Surgeons) will be open at the following times:

Thursday: 08:15-17:30  
Friday: 08:30-14:15

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.

# MEETING INFORMATION

## Venue of the Scientific Meeting

The meeting will be held in Lecture Rooms 1 and 2 of the Royal College of Surgeons.

## Congestion Charge

The Royal College of Surgeons is within the charging area.

## Car Parking

There is no car parking at the Royal College of Surgeons. There is an NCP on Kemble Street, off Kingsway.

## Accommodation

No block bookings have been made for the meeting.

## Luncheon and Refreshments

Luncheon and refreshments will be served in the Edward Lumley Hall and in the Council Room.

## Contributors Information

There will be projection facilities for PowerPoint presentations only.

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

## Continuing Medical Education

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

Thursday:	6.0
Friday:	6.0
Total:	12.0

## Society Dinner

Thursday 16th October at 19:30 for 20:15  
Sarastro Restaurant, Covent Garden  
Dress code: business attire

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

## Prizes

### *Journal of Hand Surgery Prize*

A prize consisting of book vouchers to the value of £500 will be awarded to the best paper presented at the meeting.

### *Poster Prize*

A prize consisting of book vouchers to the value of £250 will be awarded to the best poster presented at the meeting.

## **Keynote Lectures**

*Thursday, 16th October*

09:50 What to do with the degenerative PIPJ (Lecture Theatre 1)

11:30 Hand injuries in sportsmen (Lecture Theatre 1)

*Friday, 17th October*

09:00 Nerve compression in the upper limb (Lecture Theatre 1)

12:50 Comparative anatomy: The evolution of forelimb function (Lecture Theatre 1)

## **Symposia**

*Thursday, 16th October*

14:00 Scaphoid fractures (Lecture Theatre 1)

*Friday, 17th October*

11:50 How I do it - Tips and tricks (Lecture Theatre 1)

## **Anatomical demonstrations**

*Friday, 17th October*

09:30 Live demonstrations: Median nerve / Ulnar nerve / Radial nerve (Lecture Theatre 1)

## **Meetings**

*BSSH Annual General Meeting*

The BSSH Annual General Meeting will be held on Thursday 16th October at 17:30 in Lecture Theatre 1 (open to Members and Associates only).

*BSSH Meetings in 2015*

30th April-1st May: Assembly Rooms, Bath

15-16th October: One Great George Street, London

# MEDICAL AND TECHNICAL EXHIBITION

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

## Trade Exhibitors

### ACUMED

STAND NO 11

Huebner House, The Fairground, Weyhill, Hants SP11 0QN  
Telephone: 01264 774 450, Fax: 01264 774 477, Email: bob@acumed.uk.co  
Contact: Mr B Craddock

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### ARTHREX LTD

STAND NO 5

Unit 5, 3 Smithy Wood Business Drive, Smithy Wood Business Park, Sheffield S35 1QN  
Telephone: 07785 623 466, Fax: 0114 2257 8929, Email: teri.blythe@arthrex.co.uk  
Contact: Ms T Blythe

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### BSSH AUDIT DATABASE

STAND NO 1

Telephone: 07580 433 826, EMail: sharon.ross@bssh.ac.uk  
Contact: Ms S Ross

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### DEPUY SYNTHES

STAND NO 9

Capital Park, Leeds LS27 0TS  
Telephone: 07774 142 244, Email: cgearin1@its.jnj.com  
Contact: Mr C Gearing

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### FANNIN UK LTD

STAND NO 7

42 Kingfisher Court, Hambridge Road, Newbury, Berkshire RG14 5SJ  
Telephone: 01635 550 100, Fax: 01635 550 050, Email: julie.lee@fannin.eu  
Contact: Ms J Lee

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### HOSPITAL INNOVATIONS

STAND NO 13

Telephone: 02920 534 924, Email: phillwood@hospitalinnovations.co.uk  
Contact: Mr S Bone

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### JEWEL MANAGEMENT LTD T/A GENERAL MEDICAL

STAND NO 3

Crown House, Waller Road, Devizes SN10 2GN  
Telephone: 01380 734 990, Fax: 01380 739 801, Email: info@generalmedical.co.uk  
Contact: Mr J Lee

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### MEDARTIS LIMITED

STAND NO 14

18A St Christopher's Way, Pride Park, Derby DE24 8JY  
Telephone: 01924 476 699, Fax: 01924 472 000, Email: mai.widdowson@medartis.com  
Contact: Ms M Widdowson

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### MERCIAN SURGICAL SUPPLY LTD

STAND NO 12

10 Topaz Business Park, Topaz Way, Broomsgrove, Worcestershire B61 0GD  
Telephone: 0844 879 1133, Fax: 0844 879 1155, Email: john@merciansurgical.com  
Contact: Mr J Duffy

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### OSTEOTECH LTD

STAND NO 6

9 Silver Business Park, Airfield Way, Christchurch BH23 8TA  
Telephone: 01202 487 885, Fax: 01202 487 886, Email: Jackie.toms@osteotec.co.uk  
Contact: Ms J Toms

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### SOBI LTD

STAND NO 10

2 Fordham House Court, Fordham House Estate, Newmarket Road, Fordham, Cambridgeshire CB7 5LL  
Telephone: 01638 722 381, Email: leigh.dowling@sobi.com  
Contact: Mr L Dowling

# MEDICAL AND TECHNICAL EXHIBITION

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**SAGE PUBLICATIONS LTD****STAND NO 18**

1 Oliver's Yard, 55 City Road, London EC1Y 1SP

Telephone: 020 7324 8608, Fax: 020 7324 8700, EMail: henrietta.appiah@sagepub.co.uk

Contact: Ms H Appiah

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**SOVEREIGN MEDICAL LTD****STAND NO 2**

Unit 16, M11 Business Link, Stansted CM24 8GF

Telephone: 01279 816 167, Fax: 01279 816 299, Email: david@sovereignmedical.co.uk

Contact: Mr D King

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**STRYKER****STAND NO 8**

Hambridge Road, Newbury RG14 5AW

Telephone: 01635 262 455, Email: Amanda.quinn@stryker.com

Contact: Ms A Quinn

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**SWIFT****STAND NO 17**

Email: stephen.brearley@york.ac.uk

Contact: Dr S Brearley

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**TOUCH BIONICS LTD****STAND NO 15**

Unit 3, Ashwood Court, Oakbank Parkway, Livingston EH53 0TH

Telephone: 01506 438 556, Fax: 01506 439 698, Email: sally.bowie@touchbionics.com

Contact: Ms S Bowie

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**VBS DIRECT LTD****STAND NO 16**

1 Mill View Close, Bulkley, Cheshire SY14 8DB

Telephone: 0845 528 0336, Fax: 0845 528 0358, Email: stephen@vbsdirect.co.uk

Contact: Mr S Barabas

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**VERTEC SCIENTIFIC LTD****STAND NO 4**

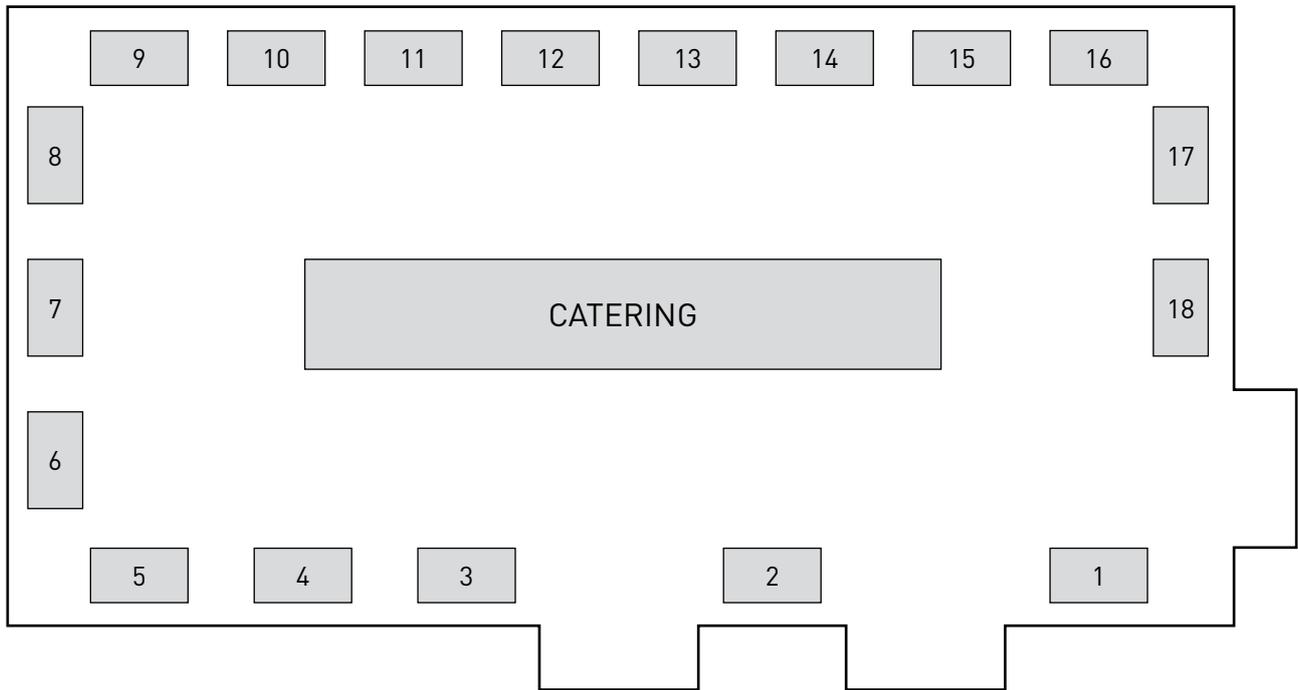
Unit 44, Easter Park, Benyon Road, Silchester RG7 2PQ

Telephone: 0118 970 2100, Fax: 0118 970 1861, Email: sales@vertec.co.uk

Contact: Mr K Lakin

# MEDICAL AND TECHNICAL EXHIBITION

## Trade Exhibition Floorplan (Edward Lumley Hall)



- |    |                       |     |                             |
|----|-----------------------|-----|-----------------------------|
| 1. | BSSH Audit Database   | 10. | Sobi Ltd                    |
| 2. | Sovereign Medical Ltd | 11. | Acumed                      |
| 3. | Jewel Management Ltd  | 12. | Mercian Surgical Supply Ltd |
| 4. | Vertec Scientific Ltd | 13. | Hospital Innovations        |
| 5. | Arthrex Ltd           | 14. | Medartis Ltd                |
| 6. | Osteotec Ltd          | 15. | Touch Bionics Ltd           |
| 7. | Fannin UK Ltd         | 16. | VBS Direct Ltd              |
| 8. | Stryker               | 17. | SWIFT                       |
| 9. | DePuy Syntehs         | 18. | 18. SAGE Publications Ltd   |







# BSSH

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at the Royal College of Surgeons

35-43 Lincoln's Inn Fields

London WC2A 3PE

Tel: 020 7831 5162

Fax: 020 7831 4041

Email: [secretariat@bssh.ac.uk](mailto:secretariat@bssh.ac.uk)