

BRITISH SOCIETY FOR SURGERY OF THE HAND
&
AMERICAN SOCIETY FOR SURGERY OF THE HAND

BSSH
The British Society for Surgery of the Hand

 **ASSH** | *American Society
for Surgery of the Hand*

**Combined
Scientific Meeting**
30 April - 2 May 2009

PROGRAMME

CHURCH HOUSE
— CONFERENCE CENTRE —

Dean's Yard, Westminster, London SW1P 3NZ
www.churchhouseconf.co.uk

BRITISH SOCIETY FOR SURGERY OF THE HAND

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Welcome Letter



We welcome you to London, one of the world's greatest cities, and to a meeting that enhances the special bond between the United Kingdom and the United States. Our citizens share more than a common language and this is reflected in the long-standing and close ties between the hand surgeons of our two countries who worked together during and after the Second World War when our specialty was in its formative state.



The programme is not only filled with scientific presentations of the highest calibre, but is augmented by specialised topic discussions and symposia that will reflect the unique views of surgeons from opposite sides of the Atlantic. It can be surprising how trends in any particular country can take root and it is both healthy and productive to re-visit the experiences of others from a different system of medicine, as these may challenge our prevailing concepts and attitudes.

Lastly, and no less importantly, is the social programme. The very best working relationships are built on mutual trust and friendship, and the social programme will allow you to reinforce existing friendships, develop new ones and through informal discussion advance the practice and science of hand surgery for all our benefit. The history of London and its many wonderful treasures and highlights are there to be appreciated by all, especially the visiting Americans with their UK friends as hosts. Have fun, relax and share and enjoy the company of the members of both Societies.



Tim Davis
BSSH
Co-Programme Chair



A. Peter Weiss
ASSH
Co-Programme Chair

Meeting Objectives

- Provide the participant an overview of current scientific research and surgical outcomes for treatment for disorders related to the hand and upper extremity
- Review detailed current state of the art on the treatment of distal radius fractures
- Review current treatment options for small joint arthroplasty and the technical tricks for successful outcomes
- Review particularly difficult hand surgery problems and their treatment options in an international format

OUTLINE PROGRAMME**BRITISH SOCIETY FOR SURGERY OF THE HAND
AMERICAN SOCIETY FOR SURGERY OF THE HAND****COMBINED SCIENTIFIC MEETING : 30 APRIL – 2 MAY 2009****Wednesday, 29 April**

17.30 Registration, Christie's
18.00 - Welcome Reception
20.30 at Christie's Auction House

Thursday, 30 April

07.30 Registration, Church House
08.00 A History of Westminster
Lecture by Mr N Barton
08.20 Scientific papers: Dupuytren's
Chairmen: Dr G Rayan and Mr R H Milner
09.36 Coffee and exhibitions
10.05 Case presentations and panel discussion
• Proximal interphalangeal joint fracture-subluxation
Dr P Stern
• Recurrent Dupuytren's contracture
Mr D Elliot
• FDP avulsion
Dr R Gelberman
• Carpal tunnel syndrome
Mr S L Knight
11.05 Scientific papers: Finger Injuries/ Measurement
Chairmen: Dr J Chang and Miss V C Lees
12.00 Lunch and exhibitions
12.15 Distal radius fracture management with Trilock multidirectional and angular stable fixation plate (sponsored by Medartis)
Chairman: Dr A Weiland,
Faculty: Dr R Gelberman, Prof A Ladd, Dr R Szabo in the Convocation Hall
13.00 Invited Lecture "The Crazy Things I do That Work Well" by *Dr A L Osterman*
13.30 Invited Lecture "Optimising the outcome of nerve repair - present and future" by *Mr A Hart*
14.00 Scientific papers: Nerve
Chairmen: Dr A Koman and Mr T E Hems
15.25 Choice of excursions, see pages 99-101
17.20 End of session

19.15 Society Dinner - Great Hall,
for 20.00 Lincoln's Inn

Friday, 1 May

07.30 Registration, Church House
08.00 Symbols of Strife:
Currency in the War of Independence,
Lecture by Dr A-P C Weiss
08.20 Case Presentations and panel discussion
• Scaphoid waist fracture with mild displacement
Dr T G Sommerkamp
• Chronic scapholunate ligament injury
Mr C Heras-Palou
• Long oblique fracture of finger proximal phalanx
Prof T R C Davis
• Trapeziometacarpal joint osteoarthritis with mcp hyperextension
Dr T Trumble

Friday, 1 May continued

09.20 Scientific papers: Audit and Congenital
Chairman: Dr M Bednar and Prof D A McGrouther
10.12 Coffee and exhibitions
10.40 Scientific papers: Wrist
Chairmen: Dr K Chung and Prof J Dias
11.38 Biomechanics of locking plates,
Lecture by Dr M Walter (Medartis)
11.48 Symposium on Fractures of the Distal Radius
Symposium Chairman: Prof A Ladd,
Faculty: Dr D Ring, Dr M Baratz, Mr N Downing, Mr M Craigen (Sponsored by Medartis)
12.45 Lunch and exhibitions
13.45 Invited Lecture "Avoiding Dogma in Hand Surgery" by *Dr R Szabo*
14.10 Invited Lecture "The need for in vitro testing of finger prostheses" by *Dr T Joyce*, Pulvertaft Prize Winner (2008)
14.35 Scientific papers: Soft Tissue Reconstruction and Neoplasia Transfer
Chairmen: Dr A Weiland and Mr J S Watson
15.40 Presentation of prize to best candidate in BSSH Diploma Examination
15.45 Tea and exhibitions
16.00 Choice of excursions, see pages 94 - 96.
18.00 End of session
Evening Free

Saturday, 2 May

07.30 Registration, Church House
08.00 Scientific papers: Distal Radius
Chairmen: Dr S Glickeland Mr R Eckersley
09.40 Happy Birthday, Gray's Anatomy
by Dr A E Flatt
09.40 Coffee and exhibitions
10.10 Symposium: Small Joint Arthroplasty
Chairmen: Dr J Slade and Mr P D Burge
• Finger proximal interphalangeal joint
Mr D Warwick
• Finger metacarpophalangeal joint
Dr C Rodner
• Wrist joint
Mr I A Trail
• Distal radio-ulnar joint
Dr D Dennison
• Trapeziometacarpal joint
Dr F Leversedge
12 noon Close of meeting, luncheon
12.45 - Tour of Westminster Abbey
17.00 and visit to the London Eye

Sunday, 3 May

Greenwich by boat from Westminster - leave approx 11am: to include Observatory, Maritime Museum, Queens House, Old Royal Naval College, Time at Greenwich Market.

WEDNESDAY, 29 APRIL

- 17:30 Registration, Christie's
- 18:00 - Welcome Reception at Christie's Auction House
20:30

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- 07:30 Registration, Church House
- 08:00 A History of Westminster
Lecture by Mr N Barton

**SCIENTIFIC PAPERS: DUPUYTREN'S
CHAIRMEN: DR G RAYAN AND MR R H MILNER**

- 08:20 **Is Percutaneous Needle Fasciotomy Safe and Effective in Treatment of Dupuytren's Disease?**
Mr M Mansha, Dr D Flynn, Professor J Stothard (Middlesbrough)

Introduction: Percutaneous Needle Fasciotomy (PNF) is performed in our outpatient clinic to treat Dupuytren's contracture at MCP joints. A recently published BSSH audit presented average national multi-centre results, and a study in our department audited the outcome of standard fasciectomy. In this study we retrospectively audited the outcome of PNF in order to compare it with national and local results.

Methods: A total of sixty-eight patients had PNF performed over a two and a half-year period (September 2005 - April 2008). All of them were sent the validated BSSH postal questionnaire assessing surgical outcome. The notes of patients, who responded that their finger was flexed, were reviewed and if in doubt were seen in clinic. The questionnaire also included hand function assessment i.e. PEM score.

Results: We received completed questionnaires from forty-six patients (51 fingers). The average pre-operative contracture of fifty-three degrees was corrected to 5 degrees at the mean follow-up of 15 months (SD+10). Twenty-nine out of 30 (97%) fingers fully corrected at surgery remained straight. One out of 46 (2.2 %) fully or almost fully corrected fingers had a recurrence which would need surgical correction in the form of open fasciectomy. Two out of 5 (40%) partially corrected fingers had recurrence. No complication (infection, neurovascular injury) was noted and no antibiotics used. The hand function measured using PEM score correlated well with the residual contracture.

Conclusion: Percutaneous needle fasciotomy is safe, effective and associated with very low complication rates. It gives comparable results to standard fasciectomy at MCP joint.

- 08:25 Discussion

- 08:28 **Dupuytren's Fasciectomy with Excision of Retrovascular Dupuytren's Tissue**
Mr J Brown, Mr A Yewlett, Mr R Savage (Newport)

Introduction: We present our findings in a case series of thirty patients' digits undergoing Dupuytren's surgery, in which retrovascular tissue (defined as Dupuytren's tissue, which is present dorsal to the neurovascular bundle) has been excised. Intra-operative deformity measurements were made using a goniometer.

Materials and Method: Eighty-six patients' digits were operated on for Dupuytren's disease within the study period by the senior author. Standard surgical techniques were used. MPJ and PIPJ fixed deformities were measured intra-operatively after each surgical step: excision of the central cord, spiral cord, accessory collateral ligaments and skin. Dupuytren's tissue dorsal to the neurovascular bundle has been termed retrovascular disease, and if present this was identified by exploration and excised.

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Results: Retrovascular tissue was present in thirty of the 86 digits, affecting the PIPJ in every case. In addition, the MPJ was affected in six of these 30 cases. The mean total correction achieved at the PIPJ in these thirty cases was 46 degrees (Standard Deviation 13°). The mean correction at the PIPJ achieved by the step of excising the retrovascular Dupuytren's tissue alone was nineteen degrees (Standard Deviation 16.7°)

Clinical Reference: In cases where full correction at the PIPJ is not achieved by excision of the central and spiral cords, we observed that retrovascular Dupuytren's tissue was present in one third of cases, and its excision significantly improved the intra-operative deformity correction.

08:33 Discussion

08:36 **Variations in Displacement of the Neurovascular Bundle in Dupuytren's Disease**

Mr S Hettiaratchy, Dr I Edmunds, Professor M Tonkin (London)

Introduction: McFarlane defined the patterns of contracture in Dupuytren's disease and how these cords form from precursors in normal fascial bands (McFarlane 1974). In the transition to pathological tissue, the normal anatomical relationships of the affected fascia are distorted. When the disease involves the pretendinous band, the spiral or oblique band, the lateral digital sheet and Grayson's ligament, contraction distorts the neurovascular bundle so that the bundle spirals around the contracted cord. Strickland described an isolated digital cord which also results in a spiral of the neurovascular bundle.

We describe six cases in which the displacement of the neurovascular bundle differs from the classical descriptions. In five cases a double spiral (corkscrew) was identified. A sixth case was one of distal spiral alone.

Methods: Six patients with non-classical displacements of the neurovascular bundle were analysed. Their pre-operative and post-operative joint measurements were documented as were the intra-operative findings.

Results: All patients underwent successful limited fasciectomy with reasonable clinical outcomes as measured by joint contracture correction. There was no damage to any neurovascular structures.

Conclusions: Dupuytren's disease normally presents in predictable patterns. However this study highlights the fact that unusual patterns can exist, resulting in the double spiral or corkscrew neurovascular bundles described here. This may not be obvious pre-operatively and highlights the necessity for identification of the neurovascular bundle throughout its course to prevent intra-operative injury.

08:41 Discussion

08:44 **The Role of Peri-Nodular Fat and Mesenchymal Fat Stem Cells in the Development of Dupuytren's Disease**

Dr S Hindocha, Dr A Iqbal, Dr S Farhatullah, Professor D A McGrouther, Mr A Bayat (Manchester)

Introduction: Dupuytren's Disease (DD) is a benign fibroproliferative disorder of the palmar aponeurosis causing irreversible digital contractures. Surgery is the mainstay of treatment; nonetheless recurrence seems an inevitable and common complication. Abnormal fibroblasts are involved in DD pathogenesis but the exact origin of these cells remains unknown. Progenitor mesenchymal stem cells maybe a potential source of abnormal cells leading to DD formation. We have previously shown genetic differences in DD tissue phenotypes and shown for the first time, the role of fat surrounding the nodule. In this study, we aim to identify whether the peri-nodular subcutaneous fat contains an abnormal source of stem cells that may have a role in the pathogenesis of DD.

Materials and Methods: Patients diagnosed with advanced DD (n=5) who underwent a fasciectomy had biopsies taken from the skin over the nodule, subcutaneous fat surrounding the nodule as well as cord, nodule and transverse palmar fascia compared to external control. Routine histology, immunohistochemical and FACS analysis with a number of stem cell makers were performed.

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Results: All DD cases showed increased peri-nodular fat wall thickness (up to seventy-five percent) compared to control. Ki67 immunohistochemistry showed an increase in peri-nodular fat proliferation. Fluorescence Activated Cell Sorting of mesenchymal stem cells identified two novel active stem cell markers present in diseased fat cells.

Conclusion: This study has shown for the first time, the presence of stem cells and a potential role for these abnormal cells in DD pathogenesis. This has significant implication in disease treatment and prevention of recurrence.

08:49 Discussion

08:52 **Staging of Dupuytren's Disease: Novel Use of 3T MR Scanning Validated with Immunohistochemistry Measures Disease Extent and Activity**

Dr V Parmar, Mr S Hindocha, Mr W Bhatti, Mr C Hutchinson, Mr L Muir, Professor D A McGrouther, Mr A Bayat (Manchester)

There have been no studies to date that have produced a validated staging system that accurately defines disease activity in Dupuytren's disease (DD). Accurate staging has a bearing on disease prognosis and choice of treatment. This is particularly significant as DD is a fibroproliferative disorder with a high rate of recurrence following surgery. This study aims to evaluate the usefulness of 3T Magnetic Resonance (MR) scanning (with contrast) by visualising DD pathology, and correlating it with immunohistological analysis to demonstrate disease activity in different DD tissue phenotypes and clinical presentations of the disease.

A 3T MR scan with contrast was performed pre-operatively on seven Caucasian male patients and T1W, T1WFS axial images were acquired. Post-contrast axial T1WFS were taken immediately and post-contrast administration. Signal intensity of the nodule was measured using Philips MR analysis software. Immunohistochemistry was performed on tissue excised from the operation for known markers of disease activity. The signal intensity of nodules as a ratio compared to control was 0.45 (0.19), 0.68 (0.31) and 0.60 (0.29) in pre-contrast, immediate post-contrast, and seven-minute post contrast scans respectively. An increase in signal intensity of the nodule in post-contrast MR scans compared to pre-contrast MR scans was demonstrated. Immunohistochemistry demonstrated a number of markers for disease activity correlating to different DD phenotypes and severity compared to the MR scans. This study has demonstrated that MR scanning is a non-invasive, yet accurate and objective method for staging DD and may provide a useful prognostic index in disease management.

08:59 Discussion

09:02 **Prospective Outcomes Assessment in Dupuytren's Contracture Comparing Palmar and Palmo-Digital Fasciectomy**

Dr J Wolf, Dr M Boyer (Denver)

Introduction: In a prospective study of limited fasciectomy for Dupuytren's contracture, the hypotheses were that patients with metacarpophalangeal (MCP) contracture only would have better pre-operative function measured on the quickDASH, than patients with proximal interphalangeal (PIP) contractures, and that patients' post-operative improvement in PIP contracture would correlate with better function.

Methods: In patients undergoing fasciectomy for Dupuytren's contracture, MCP and PIP joint contracture and quickDASH scores were recorded pre-operatively, three and six months, and one year post-operatively.

Results: Thirteen patients, 12 males and one female, with an average age of 63 were enrolled. Eleven had combined MCP/PIP contractures (group 1), and two had MCP contracture only (group 2). Pre-operative average quickDASH was fifty-six, with an average of 62 in group 1 and 29 in group 2. At three months, the quickDASH score decreased to a mean of 40 in group 1 and 25 in group 2. The post-operative MCP contracture averaged 4.5° in group 1 and 0° in group 2. In group 1, the PIP contracture improved to 16° at three months. Spearman correlations showed a significant relationship between the improvement in PIP contracture and quickDASH at three months (p=0.035).

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Discussion and Conclusions: A pre-operative correlation between patients with MCP contracture and improved functional measures was proven, with this group's score less than half of the quickDASH of patients with combined MCP/PIP contracture. Post-operatively, the quickDASH improved in both groups, with a significant correlation between decreased PIP contracture and improved functional scores.

09:07 Discussion

09:10 **Distribution of Myofibroblasts in Dupuytren's Cords**

Mr L Suleman Verjee, Dr K Midwood, Ms D Davidson, Professor J Nanchahal (London)

Introduction: Dupuytren's tissue has been typically described as comprising myofibroblast-rich palmar nodules and relatively acellular, tendon-like cords¹.

Materials and Methods: A total one hundred and three digital Dupuytren's cords (70% fasciectomy, 30% dermofasciectomy) were stained for myofibroblasts with anti-smooth muscle actin antibody. The presence of nodule(s), nodule surface area and myofibroblast numbers were quantified.

Results: Cords were either found to be nodular (sixty-five percent) or non-nodular (35%). Nodular cords contained one (55%), 2 (33%) or 3/4 nodules (12%), comprising localised collections of cells. The nodules contained the highest number of myofibroblasts (mean 99% 2650 cells/mm²) compared to perinodular (35% myofibroblasts, 804 cells/mm²) and more distant areas (7% myofibroblasts, 490 cells/mm²). Of the thirty-eight nodular samples, where the relative position of the proximal interphalangeal joint (PIPJ) was marked intra-operatively, 95% (36/38) had a nodule which co-localised with the PIPJ. However, PIPJ nodule surface area (mean 15mm², range 1.3-56mm²) did not correlate with the degree of PIPJ contracture (mean 53°, range 0-90°). Non-nodular cords contained ten - seventeen percent myofibroblasts (mean 486 and 738 cells/mm²), with higher numbers distally. There did not appear to be any correlation between nodularity and recurrent disease.

Conclusions: All digital Dupuytren's cords are cellular and approximately two thirds contain distinct nodules, with abundant myofibroblasts. Nodules co-localise with the PIPJ. Non-nodular cords also contained myofibroblasts, which tended to align in a longitudinal fashion with the collagen fibres.

¹Luck, J V (1959). Dupuytren's Contracture; a New Concept of the Pathogenesis Correlated with Surgical Management. J Bone Joint Surg 41-A, 635-10

09:15 Discussion

09:18 **Metabolic Fingerprint Analysis of Fibroblasts Derived from Differential Dupuytren's Disease Tissue Phenotypes**

Miss S Rehman, Dr P Day, Dr M Rattray, Professor R Goodacre, Dr A Bayat (Manchester)

Objective: Dupuytren's disease (DD) is a fibroproliferative tumour of unknown aetiopathogenesis. Previous studies provide compelling evidence that genetic dysregulation plays an important role in DD formation. Macroscopic phenotypic differences between fibrotic elements in DD (i.e. nodule and cord), plus the fat and skin overlying the nodule (SON) also show microscopic differences with variable cellular density. Abnormal fibroblasts are considered to be responsible for causing DD. Whether any significant changes seen are due to genetic alterations alone or consequence of metabolic dysregulation has not been demonstrated to date.

Methods: A metabolomic analysis of fibroblast cultures derived from different DD tissue phenotypes compared early (primary) cultures to late passages in order to identify the most representative passage for the disease. Using Fourier transform infrared spectroscopy, we compared metabolic profiles of endogenous and secreted metabolites from (1) DD cords and nodules against the unaffected transverse palmar fascia (internal control), (2) DD cords and nodules with fat surrounding the nodule, and SON. We then compared metabolic profiles of those in (1) and (2) between different DD patients.

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Results: Carefully controlled conditions using multivariate statistical analyses (principal component and discriminant function analysis) demonstrated early passage metabolic differences in DD and control fibroblasts, whereas higher passages demonstrated random asynchronous patterns.

Conclusion: We have shown differences between metabolic profiles of DD tissue phenotypes and for the first time, this study reports that early passage numbers are the most suitable representatives for investigating DD. We believe metabolomic strategies offer a novel approach to investigate biomarkers in tissue fibrosis.

09:25 Discussion

09:28 **Soft Tissue Distraction Lengthening followed by Full Thickness Skin Grafting for Severe Recurrent Proximal Interphalangeal Joint Contractures Secondary to Dupuytren's Disease**
Dr V Hentz (Stanford, CA)

Introduction: The incidence of recurrent contracture for Dupuytren's disease (DD) affecting the proximal interphalangeal joint (PIPJ) has been estimated at between 40% and 60%. Additional surgery to correct a severely contracted PIPJ is associated with a notable incidence of complications. In such cases many surgeons recommend fusion of the PIPJ or complex soft-tissue reconstruction. We have had success with a two-stage technique that has reduced the incidence of complications and yielded better functional outcomes than prior techniques.

Materials and Methods: We treated seven patients with recurrent PIPJ contractures (60-90 degrees.) Under local anesthesia, two threaded pins are inserted into the middle phalanx. The hand-based Digit-Widget is applied and using rubber-band traction, the PIPJ is gradually straightened over six to eight weeks. A second procedure, performed under regional anesthesia includes excision of all damaged volar skin and residual digital fascia over the proximal phalanx and full thickness skin grafting. The Digit-Widget is used post-operatively as a dynamic traction device.

Results: One patient had three digits simultaneously treated, 3 patients had 2 digits and in 4, a single digit was treated. All PIPJs achieved within five degrees of full extension using the device. There were no vessel or nerve injuries associated with the distraction phase, nor with the excision and grafting phase. Pre-operative PIPJ contractures averaged sixty-five degrees. Post-operative residual contracture averaged fifteen degrees. Post-operative PIPJ flexion averaged eighty-five degrees.

Conclusion: Preliminary soft-tissue lengthening, followed by excision and FTSGs has reduced complications and yielded satisfactory functional outcomes in severely contracted, previously operated digits.

09:33 Discussion

09:36 Coffee and Exhibitions

10:05 **CASE PRESENTATIONS AND PANEL DISCUSSIONS**

- Proximal Interphalangeal Joint Fracture-subluxation
Dr P Stern
- Recurrent Dupuytren's Contracture
Mr D Elliot
- FDP Avulsion
Dr R Gelberman
- Carpal Tunnel Syndrome
Mr S L Knight

THURSDAY, 30 APRIL**SCIENTIFIC PAPERS: FINGER INJURIES/MEASUREMENT****CHAIRMEN: DR J CHANG AND MISS V C LEES**

- 11:05 **Is the Outcome the Same following PIPJ Arthroplasty for Neglected PIPJ Fracture Dislocation and Degenerative or Inflammatory Joint Disease?**
Miss A Davy, Mr M Craigen (Birmingham)

Introduction: There are few reports regarding the outcome of PIPJ replacement following trauma. The aim of this study was to compare the outcome of PIPJ replacement performed, following neglected PIPJ fracture dislocation and patients with degenerative or inflammatory joint disease.

Materials: Seven patients (6 male, 1 female, mean age 40 years) had 7 joints replaced following neglected PIPJ fracture dislocation (T group). Eight patients (3 male, 5 female, mean age 62 years) had 12 joints replaced for degenerative or inflammatory joint disease. All presented with pain, reduced motion and stiffness. Avanta SR PIPJ replacement was performed by a single surgeon using a dorsal approach.

Results: At three months post-surgery, one prosthesis (T group) had been removed for infection. In the trauma group, the average arc of motion was 45° (range worst 30-50° to best 0-80°). In the joint disease group, the average arc of motion was 59° (range worst 0-20° to best 0-90°). Two patients (T group) subsequently underwent tenolysis. At final follow-up at twenty-eight months (range 6-102) average arc of motion in the trauma group was 20° (range worst 10-15° to best 10-60°). Average arc of motion in the joint disease group was 47° (range worst 5-10° to best 15-90°).

Conclusion: Range of motion is worse following PIPJ joint arthroplasty after fractures than in patients with degenerative or inflammatory joint disease. Movement in both groups deteriorate with time but more quickly in the trauma group. Pain relief in general was good.

- 11:10 Discussion

- 11:13 **Outcomes of Lag Screw Fixation of Spiral Oblique Fractures of the Long Bones of the Hand**
Miss E West, Miss J Rooker, Mr S Wilson (Bristol)

Introduction: A number of fixation options are available for the treatment of unstable spiral/oblique midshaft phalangeal and metacarpal fractures of the hand. A widely accepted method is that of open reduction and fixation with lag screws. We report the outcomes from sixty fractures in 51 patients.

Methods: All patients with unstable closed metacarpal and phalangeal midshaft spiral/oblique hand fractures who were treated with lag screw fixation between March 2006 and May 2008 (twenty-seven months) were identified and reviewed retrospectively collating clinical, technical, radiological and post-operative rehabilitation and outcome data. A total of seventy-five fractures in 64 patients were reviewed. Of these, fifteen fractures in 13 patients were excluded, leaving a total of 60 fractures in 51 patients.

Results: The results from thirty-three metacarpal, 25 proximal phalangeal and 2 middle phalangeal fractures in 15 females and 46 males with a mean age of 31 (range 10-67) were analysed. After a mean follow-up of nine weeks, 97% of metacarpal fractures had regained full gross composite flexion (GCF), with 3 patients (9%) having an extensor lag at the time of discharge. 80% of proximal phalangeal fractures had regained a full range of GCF however 12 patients (45%) had an extensor lag at the time of discharge. Clinical and radiological outcomes together with techniques and physiotherapy regimes used in our department will be discussed.

Conclusion: Lag screw fixation of spiral oblique fractures is technically demanding but provides strong bony fixation, allowing early mobilisation and consistently achieves good functional results.

- 11:18 Discussion

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- 11:21 **Re-Operation for Tendon Adhesions following Open Reduction and Internal Fixation of Metacarpal Fractures**
Mr S Syed, Mr R Mohammed, Dr S Hussain, Mr M Waldram, Mr D Power, Mr S Tan (Birmingham)

Aim: The aim of this study is to identify rates of re-operation for stiffness following open reduction and internal fixation of metacarpal fractures.

Material and Methods: All patients undergoing open reduction and internal fixation of metacarpal fractures from October 2007 to March 2008 at our centre were studied. The end point for the series was chosen to ensure adequate final follow-up of at least six months. All metacarpals fixed using AO/Synthes compact hand plates or lag screws were studied. Excluded from the study were complex hand injuries with fractures associated with significant soft tissue injury (synchronous tendon, nerve or vessel repairs). Complications and the need for intervention were identified from the patient follow-up record. The specific complications of stiffness, scar tenderness, infection and re-operation for any reason were documented.

Results: Forty-nine patients met the inclusion criteria for this study and 48 metacarpals in forty one patients were available for the final analysis. Eight (20%) patients had a re-operation for removal of metalwork and tenolysis. The metalwork was removed within four to six months of the fixation. There were no episodes of infection. One patient developed CRPS and one had parasthesia in the distribution of the dorsal branch of the ulna nerve. Hypersensitive scars were reported in three patients.

Conclusion: This study identified high rates of tenolysis and removal of metalwork following open reduction and internal fixation of metacarpal fractures. Informed consent should highlight these high rates of re-operation when patients undergo internal fixation of functionally displaced metacarpal fractures.

- 11:26 Discussion

- 11:29 **Visual Estimation of Computerised X-Ray Angles: Shouldn't We be Using the Digital Measuring Tools?**
Mr G Robertson, Mr B Robertson, Mr B Thomas, Mrs J McEchan, Mrs D Davidson (Edinburgh)

Introduction: There are many examples in the practice of hand surgery where clinical management may be influenced by the degree of angulation on X-rays. The Patient Archiving Communications System (PACS) has been widely introduced into hospitals, replacing hard copy X-ray films with digitalised images. Although the software allows easy calculation of angles from such images, informal observation suggests that visual estimation of angles remains a widespread practice. This study aims to assess the reliability of visual estimations, and to compare their accuracy with a 'gold standard' obtained using the digital software.

Methods: Seventy-three clinicians, from orthopaedic and accident and emergency departments, were asked to visually estimate the dorsal angulation on a series of computerised X-rays of distal radial fractures. The reliability of these estimations was calculated. Their accuracy was compared to a 'gold standard', obtained by consensus agreement between three hand consultants using the digital software.

Results: Fifty-six percent (n=41) of the participants claimed to make regular use of the angle measurement software. For the overall cohort, inter-observer reliability was calculated as ICC=0.511 and intra-observer reliability as r=0.755. When compared against the 'gold standard' computer-measured angles, the visual estimations were inaccurate by a mean percentage error of 31% (range 7-83%). Both reliability and accuracy were found to increase with level of experience.

Conclusion: Visual estimation of angles on computerised images remains widespread in clinical practice. Although reliability and accuracy of such estimation improves with experience, digital software is more reliable and accurate and its use should be encouraged.

- 11:34 Discussion

THURSDAY, 30 APRIL**11:37 Physical and Radiographic Evaluation of the Bony Anatomy of the Wrist by the Junior Doctor**
Mr A Roche, Mr G Williams, Miss D Wharton, Mr D Brown (Liverpool)

Introduction: Accurate clinical and radiographic examination of a wrist is imperative to diagnose injury. Knowledge of basic wrist anatomy is key to ensuring a complete assessment. This study tests the junior doctors' basic knowledge of bony anatomy of the wrist routinely examined in orthopaedic and emergency departments.

Methods: Examiners observed eighty-four clinicians palpating 9 landmarks on uninjured subjects. Each landmark was chosen for their relevance in assessment of wrist injuries. The landmarks were: radial styloid, ulnar styloid, hook of hamate, triquetrum, scaphoid waist, scaphoid tuberosity, proximal pole of scaphoid, pisiform and Listers Tubercle. Participants then identified the carpal bones on plain radiographs.

Results: No participant palpated all landmarks successfully. The average number palpated was 5.1 (2-8), standard deviation 1.9. Only 57% identified five or more landmarks. All participants identified the ulnar styloid, the most consistently identified. The most poorly identified was the proximal scaphoid by 20%. The mean correctly identified radiographically was 6.6 (1-8), standard deviation 2. Only 63% were able to identify the entire carpus on radiographs. The scaphoid was the most consistently identified (98%), the triquetrum was the most poorly identified (76%).

Conclusion: Radiographic knowledge of the carpal bones was superior to the clinical knowledge, which was very poor amongst junior clinicians. It is likely that junior clinicians are more reliant on radiographic evaluation of the wrist than clinical examination to aid diagnosis. This may reflect in the methods of anatomy teaching in UK medical schools today where cadaveric dissection is being replaced by other teaching modalities.

11:42 Discussion

11:45 Illness Behavior Predicts Disability as much as Diagnosis Itself
Dr D Ring, Dr J Watson (Boston)

Introduction: Evidence is mounting that self-assessed disability is related as much or more to illness behavior than to identifiable pathology. We investigated the hypothesis that depression, pain anxiety, and pain catastrophising are predictors of perceived disability, independent of diagnosis.

Methods: One thousand three hundred and seventeen patients with an isolated, discrete upper extremity condition completed the Disabilities of the Arm, Shoulder, and Hand (DASH) survey as well as one or more of the following surveys measuring pain or illness behavior: the Center for Epidemiologic Studies-Depression (CES-D) scale, Pain Anxiety Symptoms Scale (PASS), Pain Catastrophising Scale (PCS), and a ten-point ordinal pain scale. Relationships between psychosocial surveys and DASH scores were examined.

Results: A significant correlation was found between DASH score and depression, pain catastrophising, pain anxiety, and pain rating ($r = 0.40$ to 0.43 ; $p < 0.001$ for all). In multivariate analyses both pain and psychological factors were each found to be as important or more important than diagnosis itself in determining disability ($p < 0.001$).

Conclusions:

1. 'Measures of depression, pain, pain anxiety, and pain catastrophising each independently correlate with arm-specific disability.
2. 'Psychological factors had as much or more influence on disability as specific diagnosis.

11:50 Discussion

THURSDAY, 30 APRIL

11:53 **Development of a Patient-focused Hand Clinic Web Page**

Dr R Stevens, Miss K Owers, Mr G Bantick (London)

Background: Some websites about hand disorders are inaccurate and are not always patient-focused.

Aim: To survey hand clinic patients about their Internet use and what information about their hand disorder should be included on a web page.

Method: Patients attending hand clinics were invited to participate in an anonymous survey that had local audit committee approval. The survey comprised fifteen questions about their Internet use and demographics.

Results: Currently, fifty-six patients (37 (66%) male and 19 (34%) female) have completed this survey correctly with ages as distributed in Table 1. Fifty-three patients (95%) were fluent in English and only 10 patients (18%) considered themselves to have a disability. Fifty-two (93%) had access to the Internet with 46 (82%), 28 (50%), 4 (7%) and 5 (9%) accessing this at home, at work, at school and at a library or Internet café respectively. Forty-seven patients (84%) had an e-mail address. Thirty (54%) used the Internet to access health information, whilst only 15 (27%) accessed information about hand conditions or surgery. Although twenty-nine (52%) were aware that our Trust has a web site and only 16 (29%) had accessed it, 46 (82%) would access a web page for hand clinic patients and largely agreed with the information that should be included (Table 2).

Conclusion: The majority of hand clinic patients had access to the Internet and would access a hand clinic web page. There was general consensus about the information that should be included. Development of the patient-focused web page will be discussed.

Table 1: Age Distribution of Patients

AGE RANGE (YEARS)	NUMBER (%) OF PATIENTS
15-19	4 (7%)
20-29	12 (21%)
30-39	18 (32%)
40-49	6 (11%)
50-59	7 (13%)
60-69	8 (14%)
70-79	1 (2%)

Table 2: Information on Hand Clinic Web Page

ITEM OF INFORMATION	NUMBER (%) OF PATIENTS
Who we are	42 (75%)

11:58 Discussion

12:00 Lunch and Exhibitions

12:15 **Distal radius fracture management with TriLock multidirectional and angular stable fixation plate (sponsored by Medartis) – Convocation Hall**

Chairman: Andrew Weiland MD

- Surgical Approach to the distal radius fracture Dr A J Weilan
- Distal radius fractures: New adaptive plate Dr R Gelberman
- Case presentations Prof A Ladd
- Osteotomies of the distal radius Dr M Szabo

13:00 **INVITED LECTURE: “The Crazy Things I do That Work Well”**
Dr A L Osterman

13:30 **INVITED LECTURE: “Optimising The Outcome Of Nerve Repair – Present And Future”**
Mr A Hart

THURSDAY, 30 APRIL

SCIENTIFIC PAPERS: NERVE

CHAIRMEN: DR A KOMAN AND MR T E J HEMS

14:00 **Diagnostic Value of Each Finger in the Evaluation of Carpal Tunnel Syndrome**

Dr J Elfar, Dr P Stern, Dr T Kiefhaber (Rochester)

Introduction: Sensibility testing in the diagnosis of carpal tunnel syndrome (CTS) involves various tests. This notwithstanding, no single examination has proven to be of critical value in diagnosis and none reliably predict electrodiagnostic studies (EDX). Notably, there is no suggestion that any digit should be systematically excluded from evaluation in CTS.

Methods: A cohort of CTS patients were tested to comprise a prospective case series. All patients had positive EDX and isolated CTS, underwent sensibility testing by measurement of static two-point discrimination (2PD) and Semmes Weinstein Monofilament array (SWMF) in each digit.

Results: Patients subjectively complained about the middle finger over all others (fifty-one percent) and least often chose the small finger (2%). 2PD mirrored subjective data (mean 6.07mm, $P < 0.0001$). The index finger was not significantly different from the small finger. Subjective worst finger matched 2PD in over two thirds of patients. SWMF testing showed similar, statistically significant results (middle>thumb>index>small). Correlations failed between EDX, symptom maps, complaints, monofilament results or two point discrimination in the index finger. Positive correlation ($P = 0.002$, $r = 0.42$, weak) was found between EDX and 2PD of the middle finger in isolation.

Conclusions: Careful testing of individual digits reveals the middle finger as best when testing patients with CTS. The middle finger is the most likely to show changes in 2PD and SWMF in patients with positive EMG findings. Middle finger 2PD is best able to correlate (weakly) with EDX. SWMF testing does show the middle finger as more sensitive but clinical application is hampered by unavailable monofilaments.

14:07 Discussion

14:10 **Ctrac Splint: Effective Treatment for Carpal Tunnel Syndrome?**

Mr P Storey, Mr D Armstrong, Ms M Bradley, Professor F Burke (Derby)

Introduction: Carpal tunnel decompression costs the NHS approximately £600 per operation, and leaves patients at risk of scar tenderness, pillar pain, reduced grip strength and nerve damage. The Ctrac splint was designed in the USA to obviate the need for surgical decompression by mechanically stretching the transverse carpal ligament, thereby non-operatively decompressing the carpal tunnel. The splint is used for five minutes three times each day for four weeks, and as required thereafter. Despite many remarkably successful case reports from the USA, no comparative research has been reported.

Methods: A randomised control trial pilot study comparing Ctrac with Futura splints was therefore commenced at the Pulvertaft Hand Unit in Derby. Forty-nine patients with a clinical and neuro-physiological diagnosis of carpal tunnel syndrome were randomly allocated into one of the two study groups, and followed up for 12 months. Symptoms and function (Levine Questionnaire scores), sensory testing and grip analysis were compared between the two study groups, and patient satisfaction recorded.

Results: Two out of the 24 patients using the Ctrac splint had significant side effects attributable to its use. The outcomes at eight weeks showed little difference between the Ctrac and Futura groups. Patient satisfaction was around 75% for both splints. 43% of the patients were successfully managed non-operatively for six months.

Conclusions: Use of a Ctrac or Futura splint results in symptom control for about forty percent of patients with a clinical and neuro-physiological diagnosis of carpal tunnel syndrome, but the Ctrac splint costs 25 times more.

14:15 Discussion

THURSDAY, 30 APRIL**14:18 Actual Delivery Location of Carpal Tunnel Injections**

Miss R Zaliunaite, Mr C Wigderowitz (Dundee)

Introduction and Aims: Local steroid injection is an accepted non-operative treatment for carpal tunnel syndrome (CTS). However, there are concerns about the safety of injections into the carpal tunnel (CT), in particular the possible injury to the median nerve. We aimed to study the pattern of Kenalog® distribution following injection into the CT and whether the median nerve was damaged during the injection.

Materials and Methods: Kenalog® containing tissue dye was injected into the CT of twenty-nine cadaveric hand specimens. The specimens were then dissected over the days after the injection and photographed at different stages, more specifically, after both superficial (29 pictures) and deep dissections (29 pictures). The distribution of the dye was noted and the median nerve was inspected for signs of puncture by the needle.

Results: The median nerve was not damaged in any of the specimens. Superficial dissection revealed the presence of the solution in eighteen out of 29 specimens. Deep dissection showed free distribution of the solution in seventeen specimens. Moreover, the solution in the remaining twelve specimens was either confined to the tendon sheath or displayed a non-specific distribution pattern.

Conclusions: Our results suggest that with a safe and correct technique the median nerve is unlikely to be injured. Further, the technique used is likely to allow the drug to disperse freely in the CT over the days after the injection. Any of the specific distribution patterns that were observed could possibly provide patients with relief from the symptoms caused by CTS.

14:23 Discussion

14:26 Dual Portal Endoscopic Carpal Tunnel Release - A Study Of 1725 Hands

Mr B Singh, Mr P Hales (Maidstone)

Carpal tunnel syndrome is the most common compression neuropathy. Controversy persists regarding the benefit of endoscopic carpal tunnel release compared with open carpal tunnel release for pain, numbness, strength, return to work and function, scar tenderness, and complications. There is conflicting evidence in the literature about the complication rates with endoscopic release and open surgery with some reports suggesting that the endoscopic decompression, although technically more demanding has lower complication rates.

The aim of this study was to look at the success rate, failure and complications following endoscopic release. We reviewed one thousand one hundred and thirty-six patients who underwent 1725 endoscopic releases over an eight year period from January 1999 to December 2006. There were eight hundred and twenty-three females and 313 males. There were six hundred and eighty-nine bilateral (1378 hands) whilst 347 patients had unilateral involvement. The pre-operative, operative details and post-operative follow-up notes were reviewed. Data included demographics, subjective complaints, prior interventions and pre-operative examination findings.

In the present series forty-nine hands (2.8%) had failed endoscopic release and had to be converted to open procedure, a success rate of 97.2% of the technique. There were twenty minor complications which included two cases of transient post-operative numbness. There was one case of superficial infection which settled with oral antibiotics. Four patients had symptoms of chronic regional pain syndrome, two of which settled with hand therapy whilst two had further pain management with some improvement. There was no permanent morbidity and in particular there was no injury of the median nerve. There were symptoms of recurrence in eighteen hands (1%), which underwent exploration. In all cases a free fat graft was used. The present study indicates that endoscopic technique is a safe and reliable technique for carpal tunnel surgery.

14:31 Discussion

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14:34 **Changes in Patient Reported Quality-of-Life Undergoing Carpal Tunnel Decompression, from Waiting List to Four Months Post-Operation, as Assessed by the Short-Form 36 Health Questionnaire**

Dr R Smith, Dr R Stead, Mr P Sell, Miss A Armstrong (Leicester)

Introduction: UK orthopaedic waiting lists are criticised for potentially allowing patients' clinical condition to deteriorate prior to surgery. We examined the quality-of-life changes of patients undergoing carpal tunnel decompression (CTD) while on the waiting list and post-operatively. The SF36 is a reliable and validated patient satisfaction questionnaire.

Methods: All patients added to the University Hospitals of Leicester elective orthopaedic waiting list for CTD were sequentially entered into the study. Patients completed an SF36 questionnaire, (i) at list entry, (ii) on admission and (iii) four months post-operatively. The eight dimensions of the SF36 were compared across these time intervals and to UK population norms post-operatively. One-way ANOVA analyses of the means were performed.

Results: Eighty-nine patients completed all three questionnaires, average age 57 years and average wait 40 days. There were no significant falls in any SF36 dimensions while awaiting surgery, in fact five dimensions (physical function, role physical, general health, vitality and mental health) showed a statistically significant improvement ($p < 0.05$). Four of the eight dimensions (physical functioning, role physical, bodily pain and role emotion) showed significant ($p < 0.05$) improvement at four months post-operation, particularly in bodily pain. Post-operatively, patients' SF36 scores did not achieve the UK population norm.

Conclusions: The quality-of-life of patients awaiting CTD, as assessed by the SF36, does not deteriorate on the waiting list and significantly improves after surgery but not to UK population norms at four months. The SF36 can measure changes in quality-of-life of patients undergoing CTD - the most sensitive dimensions being bodily pain and physical functioning.

14:39 Discussion

14:42 **Outcome following Revision Carpal Tunnel Decompression**

Mr T Okoro, Mr A Mallick, Mr M Clarke, Mr C Kershaw (Leicester)

Introduction: Revision is performed after carpal tunnel decompression surgery due to recurrent or persistent symptoms. Post-operative patient satisfaction is poorly quantified in the available literature. This study aimed to assess subjective patient satisfaction as well as outcome.

Methods: Retrospective cohort study of revision carpal tunnel operations performed at a single institution over six years. Postal questionnaires and telephone calls were used to collate information on patient demographics, side of surgery, duration between operations, subjective patient satisfaction and the presence and nature of persistent symptoms. Symptom severity and functional status were assessed using the Levine (Boston Hand) questionnaire.

Results: Of forty-eight patients, data was available on 38 from returned questionnaires and telephone contact. Thirty patients were female while 8 were male. Nineteen patients had bilateral revisions. The median time to revision was 4.5 years. 62% of patients were satisfied with the results of revision surgery, 24% were dissatisfied and 14% unsure. Twenty-five out of 38 patients had persistent sensory symptoms in the median nerve distribution and 14 of these were constant in character. Levine scores were available on twenty-two patients. Improvement was obtained following revision surgery in mean symptom severity score (3.2 pre-op vs. 1.59 post-op) and mean functional status (2.7 pre-op vs. 1.83 post-op). The changes were similar to clinically significant differences observed after primary decompression surgery at our centre.

Conclusions: Good patient satisfaction is achievable following revision carpal tunnel surgery. Outcome quantified by severity of symptoms and degree of function is comparable to that obtained after primary surgery.

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14:47 Discussion

14:50 **Medial Pectoral to Musculocutaneous Nerve Transfer for Reconstruction of Elbow Flexion in Adult Brachial Plexus Injury**

Mr T Hems (Glasgow)

Aim: A study was undertaken to review the results of transfer of the medial pectoral nerve to the musculocutaneous nerve for reconstruction of elbow flexion in adult patients with injuries to the supraclavicular brachial plexus.

Methods: Case notes were reviewed of eight patients who had medial pectoral nerve transfers between 2002 and 2008. Three had C5, 6 injuries and 5 had C5, 6, 7 injuries. Working through a delto-pectoral approach, the medial pectoral nerve was divided as distally as possible and then sutured to the musculocutaneous nerve.

Results: Six patients have sufficient follow-up (minimum = 18 months). Four of the six patients have gained MRC grade 4 elbow flexion with three of these four are able to lift greater than 3kg. One patient, in whom there was difficulty performing the transfer because of low branching of the musculocutaneous nerve, recovered grade 3 elbow flexion. One case, who had reduced function in the medial pectoral nerve as a result of involvement of C8 had only grade 2 recovery. Five of the six patients had good remaining power in the pectoralis major at follow-up.

Conclusion: Transfer of the medial pectoral nerve is an effective method of restoring elbow flexion in upper brachial plexus injuries, providing C8 is not injured and anatomy of the musculocutaneous nerve allows direct suture of the transfer.

14:55 Discussion

14:58 **Copaxone Immune System Augmentation for Peripheral Nerve Regeneration in Crushed Rat Sciatic Nerve Model**

Dr L Katolik, Dr S Luria, Dr T Waitayawinyu, Dr T Trumble (King of Prussia)

Introduction: Immune system upregulation has been shown to play a role in the motoneuron survival after a peripheral nerve injury. We evaluate the effects of immune system augmentation, using Cop-1, on nerve regeneration.

Methods: Wild and immune (T-cell) deficient rats underwent crush injury of the sciatic nerve. The animals were divided into three groups. One group received Cop-1 at the time of injury, while the other two served as controls. Three and six weeks after the injury, the sciatic nerve was examined both functionally and histologically.

Results: Significantly greater muscle function was measured after three weeks in the group of wild type rats treated with Cop-1. Higher axon counts were also found in this group. The nude type rats showed no response to the intervention after three weeks, but showed a delayed response after six weeks.

Conclusion: We found that a single treatment with Cop-1 augmented the immune system response to peripheral nerve injury and resulted in improved functional and histological regeneration. This was limited by the addition of another later dose of Cop-1, and was significantly decreased in nude type rats undergoing similar intervention. Only a partial and late response was found in the immune deficient rats. This is the first report of the beneficial effect of the antigen Cop-1 on the regeneration of peripheral nerves. Further investigation is needed to evaluate the relationship of dosage regimen and frequency. In addition, possible alternative mechanisms of Cop-1 should be evaluated to explain the late benefit seen in the nude type rats.

15:03 Discussion

THURSDAY, 30 APRIL**15:06 N-Acetylcysteine Prevents Apoptotic Expression in Axotomised Sensory Neurons**

Mr A Reid, Professor M Wiberg, Professor G Terenghi, Dr S Shawcross (Manchester)

Introduction: Peripheral nerve injury leads to deficient sensory recovery and the neurobiological factor of axotomy-induced neuronal death must be addressed to improve clinical outcomes. Sensory neuronal death has functional preference with cutaneous sensory neurons dying in great numbers, whilst primary muscle afferents survive axotomy. N-acetylcysteine (NAC) has been proven to have neuroprotective capacity and may act at the level of the mitochondria in the apoptotic pathway, where Bcl-2, Bax and caspase-3 are of primary importance.

Methods: We utilise novel methodology combining a functionally selective in vivo rat nerve injury model with laser microdissection and quantitative real-time polymerase chain reaction (qRT-PCR) to identify crucial disparities in apoptotic mediator gene expression.

Results: The transcriptional regulation of crucial apoptotic mediators is shown to be very different between sensory cutaneous and primary muscle afferent neurons following axotomy. The cutaneous neurons display an intention towards apoptosis with progressively increased pro-apoptotic caspase-3 and Bax mRNA expression, whilst the muscle afferent neurons display a more neuroprotective pattern with decreased caspase-3 and Bax mRNA. In animals given NAC therapy following nerve injury, the mRNA expression of caspase-3 is dramatically reduced whilst that of pro-survival mediator Bcl-2 is greatly increased.

Conclusions: This study demonstrates, for the first time, important changes in transcriptional regulation of apoptotic mediators in sensory subpopulations. Further, NAC therapy following nerve injury prevents apoptotic gene expression thereby identifying a mechanism for its neuroprotective actions on the peripheral nervous system.

15:11 Discussion

15:14 Surgical Repair of Peripheral Nerves - The Current Practice of Hand Surgeons in the UK: A Questionnaire Study

Dr N Fairbairn, Mrs L Jeans, Mrs D Davidson (Livingston)

Aim: It is the aim of this study to elucidate the techniques that are currently being employed by hand surgeons in the UK to repair peripheral nerves.

Method: A questionnaire was designed and sent to all full members of the BSSH as listed in the 2008 handbook. The results were then entered into a spreadsheet for analysis. Questions left unanswered were excluded.

Results: A total of two hundred and seventy-two questionnaires were sent out. One hundred and thirteen (43%) were returned completed. Each questionnaire identified the background specialty of the consultant surgeon, whether they had a specialist interest in peripheral nerve repair, whether they had a specialist interest in brachial plexus repair, and annual numbers of repairs. With regards to mixed peripheral nerves in adults and children, we asked what the preferred method was for repairing divisions with no gaps between the ends, with gaps of less than 3cm and with gaps of greater than 3cm. The same questions were asked regarding sensory only nerves. We also asked what the preferred method was for securing nerve autografts. In the final section, we asked for the preferred method of magnification used, the use of splinting regimes, the assessment of recovery, and any methods used for sensory re-education.

Conclusion: There is a large variation in methods of repair for sensory nerves with a less than and greater than 3cm gap. In spite of the recognised limitations, this questionnaire-based study gives insight into the current techniques of peripheral nerve repair used by consultant hand surgeons in the UK.

15:22 Discussion



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15:25 Choice of Excursions

17:20 End of Session

19:15 Society Dinner
for
20:00 Great Hall, Lincoln's Inn

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07:30 Registration, Church House

08:00 Symbols of Strife: Currency in the War of Independence
Dr P Weiss08:20 **CASE PRESENTATIONS AND PANEL DISCUSSION**

- Scaphoid Wrist Fracture with Mild Displacement
Dr T G Sommerkamp
- Chronic Scapholunate Ligament Injury
Mr C Heras-Palou
- Long Oblique Fracture of Finger Proximal Phalanx
Professor T R C Davis
- Trapeziometacarpal Joint Osteoarthritis with MCP Hyperextension
Dr T Trumble

**SCIENTIFIC PAPERS: AUDIT AND CONGENITAL
CHAIRMEN: DR M BEDNAR AND PROF D A McGROUTHER**09:20 **Epidemiology of Hand Injuries in a Regional Hand Centre**
Mr S Chan, Mr S Syed, Dr C Charley, Mr D Chester (Birmingham)**Aim:** To describe the incidence and epidemiology of acute hand injuries in the adult general population.**Material and Methods:** A retrospective analysis involving a review of all casualty case notes for one month between May and June 2008 was performed. Data was collected, using a standardised pro-forma, which included patient demographics, mechanism of injury and their subsequent management. The diagnoses were based on clinical examination in A&E and basic investigations.**Results:** A total number of six thousand nine hundred and eleven new patients presented to A&E during the study period. Of those, 717 new hand injuries were identified (incidence 10%). 51% were minor soft tissue injuries, 19% closed fractures, 6% tendon injuries, 6% open fractures, 4% infections and 1% dislocations. The majority of hand injuries were treated by A&E but 22% were referred onto the hand team. 11% of injuries were related to recreational and sporting activities, 9% to industrial accidents and 8% were DIY and gardening accidents. Of those, a significant proportion involved the use of power tools. In the paediatric group, there was a significant proportion of crush injuries in comparison to adult crush injuries (25% vs. 9%).**Conclusion:** Hand injuries are much more common than initially thought. Even in a tertiary referral centre, the majority of hand injuries are minor soft tissue injuries and can be treated in A&E. Primary prevention recommendations may help reduce the incidence particularly in high risk groups. Of particular importance are addressing the concerns of power tool use within the home and paediatric injuries.

09:25 Discussion

09:28 **Motorcycle Accidents: Patterns of Upper Limb Injury and Outcome in a Semi-rural District General Hospital**

Mr S Muthian, Mr S Wimsey, Mr W Samuel (Winchester)

Aim: To assess the trauma admissions arising from motorcycle injuries in a district general hospital over a period of one year and to determine the impact of upper limb injuries.**Methods:** Retrospective study using case notes. Forty-one patients were identified from the trauma admissions over a year. Variables studied included patients' age/sex profile, employment, vehicle type, reason for travel, mode of injury, speed of vehicle, use of protective clothing, involvement of other passengers, injuries sustained, treatment required, time to surgery (from admission), surgery required, duration of inpatient and outpatient treatment, complications and outcome.

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Results: Forty-one patients, 40 male and one female. The age range was 12-67 years, average being 31.39 years. 26.8% had significant non-orthopaedic injuries. 75.6% had fractures and 21.9% of patients had open injuries. 31.7% of patients had multiple fractures. The average time to surgery was 1.2 days. The average inpatient stay lasted 8.46 days. The average outpatient follow-up required was 7.15 months. 19.5% had complications, 9.7% requiring a further procedure. At follow-up, 65.8% reported a return to normal activities.

Discussion and Conclusion: Motorcycle accidents result in high morbidity. More than one third of patients have upper limb injuries. There is a high risk of fracture, requiring surgery. Over a quarter of patients have significant non-orthopaedic trauma. Stringent standards of safety are required and motorcyclists should be made aware of the risks involved, to promote road safety.

09:33 Discussion

09:36 **Trigger Digit: Is Corticosteroid Injection Worthwhile?**
Mr G Brigstocke, Mr M Gupta, Miss S Burgert (Chichester)

Aim: Corticosteroid injection is a widely-practised first-line treatment for adult trigger digit. This prospective study assesses whether corticosteroid injection is worthwhile in the management of trigger digit by quantifying the amount of patients proceeding to surgical release despite initial injection.

Methods: One hundred and twenty-nine consecutive patients were prospectively enrolled over a seven-year period. Exclusion criteria included multiple or recurrent triggering digits, rheumatoid arthritis and diabetes. Demographic data was recorded and the flexor sheath injected with corticosteroid and local anaesthetic. Theatre records and hospital admission data were studied to quantify how many of the enrolled patients proceeded to surgical release within twenty-four months of injection.

Results: One hundred and six individuals were included in the study group, comprising 63 female and 43 male patients with a mean age of 63 years (range 35-82 years). The most commonly involved digits were the ring finger (35%), thumb (28%) and middle finger (29%). Thirty-eight patients (36%) eventually proceeded to surgical release. This represented a persistence of symptoms requiring surgery of 38% of injected fingers and 30% of injected thumbs. The mean time from initial injection to surgery amongst the thirty-eight patients with persistent symptoms was 9.3 months (range 3-23 months).

Conclusions: Sixty-four percent of patients whose trigger digit was initially managed with corticosteroid injection avoided the requirement for surgical release within 24 months of injection. Therefore, corticosteroid injection has a valid role in the management of trigger finger, however, patients must be aware of the risk of persistent symptoms requiring further intervention.

09:41 Discussion

09:44 **WRULD and Keyboard Workers: Does Workstation Modification and Physical Training Really Make a Difference?**
Mr B Povlsen (London)

Introduction: Keyboard workers are often affected by repetitive strain injuries known as work related upper limb disorder (WRULD). Workstation modification and physical training are thought to improve this condition but no prospective studies have shown that this really makes a difference.

Aim: To prospectively evaluate whether patients with WRULD are any better after six months of workstation modification and physical training.

Material and Method: Six pain free controls and 17 patients were included. Recordings were made of pain before and after a thirty-minute standardised functional typing test as well as typing endurance and typing speeds before and after introduction of optimal work station modifications and completion of a physical treatment programme.

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Results and Statistics: Two-tailed student T-test with P level at 0.05 was used for evaluation. Before the interventions the control group was significantly better in all measurements compared with the patient group. After the interventions the patient group had significantly less pain both at rest and after the functional test. The typing endurance improved significantly in the patient group after the interventions but the typing speeds were similar. After the interventions there was no longer a significant difference in endurance between the control group and the patient group.

Conclusion: Keyboard workers with WRULD can derive significant benefit from workstation modifications and a six-month physical rehabilitation programme but are unlikely to become normal.

Clinical Reference: Povlsen B, Lee-Rose R “Managing Type II Work Related Upper Limb Disorders In Keyboard And Mouse Users Who Remain At Work”. J. Hand Therapy. 2008, 21; 69-79.

09:49 Discussion

09:52 **Use of Plantar Split Thickness Skin Graft in Primary Correction of Syndactyly**

Mr A Lahiri, Mr N Patel, Mr M Sood (Chelmsford)

Introduction: Syndactyly is one of the most common congenital limb anomalies. Surgical correction involves separation of fingers and creation of a commissure with skin flaps with or without additional skin grafts. There has been considerable debate regarding the merits and demerits of using full thickness or split thickness skin grafts, different donor sites or altering flap designs to avoid skin grafts. We present our results of using plantar split thickness skin grafts.

Material and Methods: We use a dorsal flap to create the commissure and narrow triangular interdigitating flaps to cover most of the sides of the involved fingers. The remaining areas are covered with a split thickness skin graft taken from the instep area. A superficial layer of graft is harvested first which is replaced on the donor site. The second layer containing more dermis is used for the fingers.

Results: This technique has been used in thirty-five patients over the last three years. We have not encountered any donor site morbidity or graft loss. One patient needed a correction for web creep. The patients were happy with the cosmetic appearance and did not report any pain at the donor site or any later difficulty with walking.

Conclusions: The traditional teaching for correction of syndactyly includes use of full thickness of skin graft from the groin. This can be associated with hyperpigmentation or hair growth. The technique we follow avoids these problems and replaces skin of the side of the fingers with similar quality skin with minimal donor site morbidity.

09:59 Discussion

10:02 **Long-term Results of Callus Distraction Lengthening in the Hand and Upper Extremity for Traumatic and Congenital Skeletal Deficiencies**

Dr W H Seitz, Jr, Dr P Shimko (Cleveland)

Materials and Methods: Four hundred and twelve individual lengthenings have been performed over a 22-year period with follow-up ranging from one to twenty-one years. Skeletal segments lengthened include the humerus, radius, ulna, metacarpals, and phalanges. Indications for lengthening have included severe congenital deficiency of the humerus, radius and ulna, radial and ulna club hand, and hypoplastic or absent finger rays as well as posttraumatic deficiencies due to segmental bone loss and amputations at multiple levels. Lengthening has ranged between twenty and four hundred percent of the original length of the skeletal segment elongated. Primary neo-osteogenesis has been achieved in 94% of cases with only 6% requiring supplemental bone grafting. Major complications have occurred in 9% of lengthenings while minor complications (most commonly pin tract infections) have occurred in 46% of cases but have resolved without significant sequelae. Complications have provided the impetus for improved techniques and have spurred research into improved methods of combining elongation with enhanced function.

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Results: In all cases elongation was undertaken for enhanced function. Therefore a functional follow-up evaluation was performed which demonstrated improved prosthetic wear in individuals where stumps were lengthened for improved mechanical advantage. Two-point discrimination and dexterity demonstrated enhanced ability to manipulate fine objects, use writing instruments and perform activities of daily living, while maintaining a stable degree of both protective and discriminatory sensation throughout the lengthening process with preservation at the time of final evaluation. Protection of physal plates in skeletally immature patients has demonstrated persistent growth of the lengthened part while lengthening in the absence of a healthy physal plate or through previously transplanted bone has generated a need in some cases for secondary lengthening. Family and patient satisfaction rates are extremely high with 95% of patients demonstrating a willingness to undergo this surgery a second time in order to achieve the same functional result.

Conclusion: Although there is a longer duration of time necessary for consolidation of bone than needed with prior techniques of rapid lengthening and bone graft interposition, the current technique of callotasis lengthening has obviated the need for a second operative procedure (in most cases for bone grafting) and has reduced the morbidity associated with this second procedure. The slow lengthening technique utilised has also demonstrated an acceptable level of comfort throughout the lengthening and consolidation period.

10:09 Discussion

10:12 Coffee and Exhibitions

**SCIENTIFIC PAPERS: WRIST
CHAIRMEN: DR K CHUNG AND PROF J DIAS**

10:40 **Hand Therapist-led Clinics Utilising MRI following Acute Traumatic Wrist Injury**
Ms G Branstiter, Mr M James (London)

Introduction: A wrist assessment clinic, conducted by hand therapy clinical specialists, supported by a consultant, was established to allow direct access from A&E. The purpose was to identify acute ligament damage and shorten the patient pathway. Prior to this clinic the patient pathway was too long to allow for acute ligament repair and often resulted in salvage procedures with less than optimal patient outcomes.

Method: Patients sustaining a traumatic injury to the wrist were first assessed in A&E. Highly suspicious fractures were referred directly to fracture clinic. All other patients were advised to schedule an appointment for an assessment if painful after ten days. Provocative wrist manoeuvres were used to clinically assess. All patients with positive clinical findings were referred for MRI's.

Results: Fifty patients assessed within the clinic and 20 receiving MR Imaging resulted in the diagnosis of three missed scaphoid fractures, three distal radius fractures, one ulna fracture, eight TFCC tears, one scapho-lunate tear, one synovitis, one lunate subluxation and ten ganglions. Pathway to surgery was significantly shortened allowing for primary repairs and interventions.

Conclusion: Our results were significant and exceeded the original intent of the clinic. The significance of MR Imaging has proven so effective in diagnosing acute wrist damage, we have proposed the use of MRI's with all acute wrist injuries presenting to A&E. Imaging and clinical assessment has resulted in a greater number of optimal patient outcomes and satisfaction.

10:45 Discussion

10:48 **Three Technical Tips for the Modified Brunelli Procedure**
Mr N Riley, Mr C Sivaji, Mr G Packer (London)

Scapholunate instability is the most common type of carpal instability seen in clinical practice. The Brunelli procedure is a validated method for treating this and correcting the flexed scaphoid. A key stage of the operation is to pass a slip of flexor carpi radialis (FCR) tendon from volar to dorsal through a hole drilled in the distal pole of the scaphoid. If during passage through the hole the tendon fibres become

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frayed or attenuated this reduces the strength of fixation which can be achieved. We describe three technical tips to facilitate this potentially troublesome stage of the operation.

1. Following placement of the guidewire, we recommend drilling in a volar to dorsal direction, and then subsequently a dorsal to volar direction to remove any bone fragments from the dorsal aspect of the scaphoid. This prevents catching of the tendon and possible fraying.
2. Lubrication of the tendon with a sterile lubricant such as Instillagel® (CliniMed Limited, Cavell House, Knaves Beech Way, Loudwater, Bucks) enables the tendon to slide freely through the bony tunnel.
3. A Jobson's probe is passed through the bony tunnel from dorsal to volar and the tendon is sutured to the hole on the Jobson's probe. As the tendon is passed through the tunnel the surgeon has enhanced control of the tendon.

By employing these three steps, we have reduced the frequency of FCR fraying, bunching, attenuation and have achieved improved fixation of the tendon to the lunate.

10:53 Discussion

10:56 **Triangular Ligamentoplasty in Instability of the Distal Radioulnar Joint Technical Description of Surgery**

Dr S Vidal Rodriguez, Dr J De Haro Monreal (Madrid)

Introduction: There are various types of DRUJ instability. The cases in which a reconstructive ligamentoplasty is indicated are controversial. There are various surgical techniques. Coinciding with the historical scientific times, Dr De Haro designed Haro's triangular ligamentoplasty, similar to the one described by Brian D Adams, MD.

Materials And Methods: We will provide a retrospective description of the medical histories of patients treated with Haro's triangular ligamentoplasty and the clinico-functional results, obtained from January 2000 to January 2007. The anatomical reconstruction of the TFCC with the FCU tendon is considered as Haro's triangular reconstruction: the excision of the FCU, cleaning the remains of the TFCC, the construction of a tunnel from dorsal to palmar at a medial and distal angle from the radial to the base of the cubital styloids, the insertion of the tendon, anchoring the bone and inserting a Kirschner needle to temporarily block pronosupination. Our series describes the results - very good: 100% mobility and no pain; good: 80-90% mobility and no pain; average: less than 80% mobility and sporadic pain during physical exertion; bad: less than 50% mobility and pain during day-to-day activities.

Results: Thirty-eight surgical procedures were carried out. Twenty males and 18 females were operated on: 82% led to very good-good results, 12% of cases led to average results and 6% led to bad results.

Conclusions: The reconstructive technique described by Dr De Haro gives adequate and functional stability in DRUJ instability.

11:01 Discussion

11:04 **Tendon Graft - Ulna Fixation in Distal Radio-Ulnar Joint Stabilisation: Biomechanical Comparison of Three Graft-Bone Fixation Methods**

Mr N Kalson, Mr C Charalambous, Mr A Hearnden, Dr E Powell, Professor J Stanley (Wigan)

A common distal radioulnar joint (DRUJ) stabilisation procedure uses a tendon graft, running from the lip of the radial sigmoid notch to the ulnar fovea and through a bony tunnel to the ulnar shaft, before being wrapped round the distal ulna and sutured to itself. Such graft fixation can be challenging and requires a considerable tendon length. The graft length could be reduced by fixing the graft to the ulna using a bone anchor or interference screw. The aim of this study was to compare the strength of three distal ulna graft fixation methods (tendon wrapping and suturing, bone anchor and interference screw).

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Four human cadaveric ulnae were used. A tendon strip was run through a tunnel in the distal ulna and secured by: 1) wrapping round the shaft and suturing it to itself, 2) a bone anchor and 3) an interference screw in the bone tunnel. Load to failure was determined using a custom made apparatus and an Instron machine.

Maximum failure load was highest for the bone anchor fixation (99.3±23.7N), followed by the suturing (96.2±12.1N), and the interference screw fixation (46.9±5.6N). There was no significant difference between the tendon suturing and bone anchor methods, but the tendon suturing was statistically significantly higher compared to the interference screw (P=0.028).

In performing anatomical stabilisation of the DRUJ fixation of the tendon graft to the distal ulna with a bone anchor provides the most secure fixation. This may make the stabilisation technique less demanding and require a smaller tendon graft.

11:09 Discussion

11:12 **Ulnar Variance and Load Transfer in the Forearm during Maximum Grip: A Finite Element Study**

Dr M K Gislason, Dr D Nash, Mr M Bransby-Zachary, Mr T Hems, Dr B Stansfield (Glasgow)

Introduction and Aims: A finite element model of the wrist joint has been developed and used to simulate the effects ulnar variance had on the load distribution to the radius and ulna during gripping, and compared to published measurements, which used load cells placed on the forearm bones to measure the load ratio.

Material and Methods: Three finite element models of the wrist were created, including the distal end of the radius and ulna, 7 carpal bones (pisiform was omitted) and the proximal third of the metacarpals. The finite element model was geometrically based on high resolution 3T MRI scans. The scans were digitised, using Mimics software, where three dimensional objects of the bones were created and meshed. The structure was assembled in Abaqus v.6.7, where the modelling was carried out. Subject specific loading conditions were applied to the metacarpals, where the subjects carried out grip strength measurements, where the measured forces were converted into contact joint forces using a biomechanical model.

Results and Statistics: The load transfer percentage for the natural ulnar variance of each subject was calculated. The ulna was then moved 4.5mm in proximal and distal directions, simulating negative variance and positive variance. The results are summarised in Table 1.

Table 1: The effect of positive and negative ulnar variance on forearm load transfer.

Subject 1 [%]	Subject 2 [%]	Subject 3 [%]	Cadaveric study [%]	Variance	Radius Ulna	Radius Ulna	Radius Ulna	Radius Ulna
- var	92.6	7.4	93.8	6.2	88.8	12.2	95.7	4.3
0	91.1	8.9	92.8	7.2	78.7	21.3	81.6	18.4
+ var	54.0	46.0	89.0	11.0	63.5	36.5	58.1	41.9

The cadaveric data is taken from Palmer and Werner (1984).

Conclusions and Clinical Reference: The results show a dramatic increase in the load transfer through the ulna for the positive variance simulation in two of the three subjects. The results are in coherence with the findings of Palmer and Werner (1984). This model has the potential for modelling other pathologies and interventions.

11:17 Discussion

11:20 **Early Results of Universal-2 Wrist Replacements**

Mr K Jain, Mr S Auplish, Mr M Hayton, Professor J Stanley, Mr I Trail (Wigan)

Introduction: Wrist replacement has evolved over the past two decades, with the Universal-2 uncemented wrist replacement as the most recent design. We present the clinical and radiographic results of the Universal-2 wrist replacements performed at Wrightington Hospital.

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Material and Methods: Thirty-two consecutive patients with 34 wrist replacements with minimum two years follow-up were included in the study. The outcome was assessed using the DASH score and Wrightington wrist outcome measure, which assesses grip strength, pain and function. Pre-operative data was available for fifteen patients. Yearly follow-up wrist X-rays were compared for evidence of loosening, subsidence and osteolysis.

Results: The mean post-operative DASH score was 45.77 (range 4 to 91). Mean post-operative grip strength was 7.4 kg (range 2.7 to 14 kg), pain score 2.1 (range 0 to 8) and function score 4.97 (range 0 to 9.8). There was a significant improvement in mean pre-operative to post-operative DASH score ($p=0.004$), grip strength ($p=0.0002$), pain score ($p<0.0001$) and function score ($p=0.0002$). No lucency or lysis was noted around any radial component. 1mm lucency was noted in the carpal component of four wrists and osteolysis in one wrist. Subsidence was noted in seven carpal components (range 3 to 5mm). Three wrists underwent fusion after failure, following one wrist infection and two cases of aseptic loosening.

Conclusion: Early results following Universal-2 wrist replacements are good and promising.

11:25 Discussion

11:28 **Total Wrist Arthroplasty - A Review of Patients with Dysfunctional Wrists**

Dr C C Y Lai, Associate Professor W Conolly (Sydney)

Background: The wrist is essential for augmentation of fine motor control of the hand and fingers. The normal wrist motion involves a complex interaction of articulations from the radius, ulna and carpal bones. Hence, when a disease process disrupts any one of these elements, a painful, deformed and dysfunctional wrist arises. Total wrist arthroplasty is considered an alternative surgical option to wrist fusion for the management of advanced wrist arthritic diseases. Though less commonly performed in comparison to lower-limb arthroplasty, wrist arthroplasty has its role as a salvage procedure to alleviate pain and to preserve function in the wrists.

Method: Four patients were collected from the Centre of Hand Surgery, Sydney. Medical records of these four patients were reviewed. The patients' pre- and post-operative functional status via clinical and radiographic assessments was closely followed over an average period of five years to ensure the continuity of progress. A table was formulated to provide an objective survey of both quantitative and qualitative improvement of a patient's wrist function.

Result: The four patients received different types of prostheses. This is an indication of a lack of universal acceptance of wrist anatomy and biomechanics. Regardless, all patients in this study had improved functional outcomes. Pain-relief was the most successful aspect of wrist arthroplasty during post-operative follow-ups. The successful outcome of these patients in the study has proven that total wrist arthroplasty can provide pain relief and an improvement in hand function through appropriate patient selection, careful peri-operative planning, sound operative technique and well-designed post-operative hand therapy.

11:36 Discussion

11:38 **Biomechanics of Locking Plates**

Dr M Walter (Medartis)

11:48 **SYMPOSIUM ON FRACTURES OF THE DISTAL RADIUS**

Chairmen: Dr A Ladd

Faculty: Dr D Ring, Dr M Baratz, Mr N Downing, Mr M Craigen
(Sponsored by Medartis)

12:45 Lunch and Exhibitions

13:45 **INVITED LECTURE: "Avoiding Dogma in Hand Surgery"**

Dr R Szabo

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14:10

INVITED LECTURE: “The need for in vitro testing of finger prostheses”

Dr T Joyce, School of Mechanical and Systems Engineering, Newcastle University
Pulvertaft Prize Winner 2008

The history of finger joint replacement has been littered with many implant designs which have performed poorly in the body. Recent additions to this list include the WEKO and the LPM implants. While the reporting of failures can provide useful information, and this knowledge can be further enhanced by a full analysis of explanted finger prostheses, for the surgeons and patients involved it may be a case of ‘locking the stable door after the horse has bolted’.

The WEKO implant probably failed due to a design flaw which resulted in the generation of excessive titanium wear debris. The LPM proximal interphalangeal prosthesis could have failed by its hard coating separating from the body of the implant and forming a grinding paste within the patients’ joints. One factor which links these prostheses with earlier failed implants is the lack of appropriate in vitro testing of the devices. Many of the currently-available designs of finger prostheses also appear to be similarly untested in vitro.

This disappointing situation can be contrasted with the huge amount of in vitro testing of hip and knee prostheses which is reported in the scientific literature. Therefore it may be that some of the success of hip and knee arthroplasty compared with the relative lack of success of finger prostheses could be explained by the contrasting importance of in vitro testing.

Producing a suitable test device for finger prostheses is not without its challenges. Machines which simply flex and extend a test implant have been shown to be unable to reproduce clinical type fractures. However, employing a device which regularly interspaces a static ‘pinch’ load with flexion-extension has resulted in fractures of Swanson, Sutter and NeuFlex metacarpophalangeal prostheses in a time and a manner comparable with clinical experience.

What is the implication of the lack of appropriate pre-clinical testing of finger prostheses for hand surgery? We will continue to see new designs of finger implants fail. Some will be reported, but it is likely that many more will not. If current and future designs of finger prostheses were appropriately tested in vitro, then those shown to be the best available could be implanted with a degree of confidence. This confidence could ripple outwards to colleagues in rheumatology who help to propose patients for hand surgery and, perhaps most important of all, to the patients themselves.

While the in vivo test will always be the truest test, in vitro testing has a critical part to play to ensure that the finger prostheses which reach the patients are the best available.

**SCIENTIFIC PAPERS: SOFT TISSUE RECONSTRUCTION AND NEOPLASIA TRANSFER
CHAIRMEN: DR A WEILAND AND MR J S WATSON**

14:35

Use of Acellular Dermal Regeneration Template (ADRT) for Soft-tissue Reconstruction in Hand Injuries

Dr J Taras, Dr J Roach (Philadelphia, PA)

Introduction: To demonstrate acellular dermal regeneration template (ADRT) to be an effective skin substitute in complex hand injuries with soft tissue defects.

Materials and Method: ADRT was used to reconstruct twenty-seven hand injuries in 20 patients with exposed bone, tendon, joints, and/or hardware. Of twenty patients, 18 suffered digital amputation injuries, 7 suffered skin degloving injuries, and 2 patients required extensive debridement after infection. ADRT, which includes a temporary silicone epidermal substitute and an artificial dermal layer, was sutured over the soft tissue defect. In all patients, a neodermis formed within ten to 14 days, and the silicone layer was removed. Patients then underwent full thickness epidermal autografting.

Results: Twenty-seven applications of ADRT were performed on 20 patients. The mean post-operative follow-up period extended four months. All patients had exposed bone, one patient had multiple exposed joints, one patient had exposed hardware, and 7 patients had exposed tendons. The application area ranged

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from 4-14cm². All patients demonstrated 100% vascularisation of the skin substitute. Full-thickness epidermal autografting was performed an average of 22.4 days after ADRT application and demonstrated a 100% take in twenty-four sites and partial graft loss of 15-25% in three sites that did not require further treatment. All patients were followed until healing was determined to be clinically complete.

Conclusions: ADRT is an effective treatment for skin substitute in hand injuries with soft tissue defects involving exposed bone, tendon, and hardware. The neodermis facilitates epidermal autografting with hand injuries that otherwise would require flap coverage.

14:42 Discussion

14:45 **Lower Extremity Free Perforator Flap Soft Tissue Coverage for Large Defects of the Distal Upper Extremity**

Dr R Jakubietz, Dr M Jakubietz, Professor R Meffert, Dr K Schmidt, Professor J Gruenert (Germany)

Background: Large soft tissue defects of the upper extremity are a challenging problem for the hand surgeon. A lack of local tissue often requires free tissue transfer to maintain function of exposed tendons, vessels, neural tissue and bones. Free fasciocutaneous perforator flaps harvested from the lower extremity allow transfer of thin, well vascularised tissue while eliminating problematic donor site morbidity of the upper extremity.

Material And Methods: Options for perforator flap coverage of the distal upper extremity are presented. Case reports show our approach to large post-traumatic defects of the forearm and wrist. The ALT and the peroneal artery perforator flap have become our primary choice due to reliable vasculature and resilient tissue.

Results: Perforator flaps offer a demanding option for the coverage of large distal upper extremity defects. Free fasciocutaneous perforator flaps are thin and pliable and thus ideal for soft tissue reconstruction of the forearm and hand. Tissue transfer is achieved without sacrificing the latissimus dorsi muscle. When the lower extremity is chosen as the donor site, patients benefit from no further impairment of the upper extremity. The size of the ALT allows for coverage of up to 50% of the circumference of the wrist in most. Smaller defects are better addressed with the peroneal artery perforator flap. Incorporation of the fascia allows a reconstruction of the gliding surface superior to muscle flaps. Due to relatively constant anatomy these flaps can be quickly harvested and transferred.

14:52 Discussion

14:55 **Thumb Reconstruction with Modified Free Wrap-Around Flap: A Follow-up of Sixty-five Cases**

Dr Y Pan, Professor G Tian, Dr L Zhang, Dr C Li (Xicheng District)

Objective: To evaluate the post-operative results of the reconstructed thumbs and the donor feet after thumb reconstructions with modified wrap-around flap.

Methods: From 2003 to 2007, sixty-five cases who received modified technique for thumb reconstruction were followed up. The reconstructed thumbs and donor feet were examined and photographed. Foot Function Index-verbal rating scales (FFI-5pt), American Orthopaedic Foot and Ankle Society (AOFAS) for hallux metatarsophalangeal-interphalangeal score, gait analysis and dynamic pedobarograph were conducted.

Results: Patients were followed up post-operatively with a mean period of twenty-two months (range 6-60 months). The reconstructed thumbs had aesthetic appearance, satisfactory range of motion, and their two-point discrimination was 9.7±2.8mm. Full or most length of the donor toes was preserved in sixty-three patients. The remaining plantar strip skin that covered the plantar weight-bearing area was 24.5±3.7cm width with a two-point discrimination of 9.0±2.6mm. The FFI-5pt score was 3.2±2.9, and the AOFAS score was 87.1±7.5. The durations of sub-phases of the gait cycle of the donor foot and intact foot had no statistical difference. The peak force and force-time integral of the two whole feet also had no statistical difference. The peak force of the donor toes was statistically smaller than that of the intact toes, but the

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peak pressures had no significant difference. The peak forces and peak pressures of the other six anatomical sites of the two feet had no statistical difference.

Conclusions: Using the modified wrap-around flap for thumb reconstruction, we obtained aesthetic and functional thumbs, and preserved most of the function of the donor feet.

15:02 Discussion

15:05 **Thumb Reconstruction in Severely Burnt Patients**

Dr C Leclercq, Dr J-M Rochet (Paris)

Amputation of the thumb in severely burnt patients is specific, because it is often associated with multiple finger amputations, and because of the poor quality of the surrounding structures. When the amputation is bilateral, thumb reconstruction is critical for restoration of function. The initial tissue damage, both locally and at a distance, makes local flaps hazardous, reduces the availability of donor sites, and increases post-operative complications.

Our experience is based on twenty-two thumb reconstructions in 20 severely burnt patients (35% to 90%TBS). The choice of procedure depended on a combination of several factors including level of amputation, functioning thenar muscles, length and mobility of the fingers, and potential donor sites. In sixteen cases we performed a toe transfer, complete (8 cases), or partial (8 cases). Complications included three failures, in two of which thumb length was salvaged by an abdominal flap, despite one local infection. Two cases underwent a pollicization of a damaged index finger. In two other cases, we did a phalangisation of the first metacarpal, with a limited functional result. Two patients had a progressive distraction-lengthening of the thumb, with technical difficulties related to progressive closure of the web space, and pin tract infection.

Re-establishment of a pinch in this group of patients has involved additional procedures in the majority of cases, including restoration of a first web space, and reconstruction of an index (or a long) finger. One of the critical factors to successful restoration of a pinch was length of the index (or long) finger and mobility of its MP joint.

15:10 Discussion

15:13 **Thumb Reconstruction following Resection for Malignant Tumors**

Mr A Abood, Mr B Mehrara, Dr P Cordeiro, Dr E Athanasian, Dr E Halvorson, Dr A Pusic (New York)

Background: Although limb salvage is possible for most extremity sarcomas, amputation has often been advocated as the treatment of choice for tumors involving the digits. The thumb poses a dilemma, however, because loss of its function can severely impair the use of the hand and entire upper limb. The authors report their experience with thumb reconstruction following wide excision of bone and soft-tissue tumors of the thumb.

Methods: This was a retrospective review of all patients who underwent excision of thumb or first ray tumors between 1994 and 2005 followed by reconstruction at Memorial Sloan-Kettering Cancer Center. Patient demographics, tumor pathologic findings, ablative and reconstructive operations performed, post-operative adjuvant therapy, recurrence, and survival were analysed. Function and reconstruction outcomes were assessed.

Results: Seventeen patients were identified with bone or soft-tissue sarcomas, melanoma, or squamous cell carcinoma. Median follow-up was thirty-three months (range: 6 to 105 months; mean: 47 months). Negative resection margins were achieved in all patients. Of the sixteen patients who underwent reconstruction, three had a reconstruction using free tissue transfer, four had a pedicled flap, one had an axial based local flap, one had a fillet flap, and seven achieved wound closure directly or with the use of skin grafts. The mean American Musculoskeletal Tumor Society Score following reconstruction was 28.8 (95.8 percent).

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Conclusions: Thumb reconstruction and salvage after tumor resection following wide excision is technically possible. Reconstruction following accepted reconstructive principles and techniques can result in acceptable functional outcomes with low risk of complication.

15:18 Discussion

15:21 **Limb-Salvage Surgery for Osteosarcoma of the Distal Radius: A Case Series**

Dr J Erickson, Dr P Jebson, Dr E Athanasian, Dr P Murray, Dr P Cederna (Ann Arbor)

Introduction: Primary osteosarcoma of the distal radius is extremely rare. We present a case series of seven patients from multiple institutions with biopsy-confirmed osteosarcoma of the distal radius who underwent resection and skeletal reconstruction, one of the largest series in the literature.

Methods: A multi-institutional review of seven patients with osteosarcoma of the distal radius was performed between 2000 and 2008. Surgical margins, local recurrence, systemic recurrence, tumor response to chemotherapy, complications, and patient satisfaction were assessed retrospectively. There were four females and three males in the series. Ages ranged from six to 50 years (median 27 years). Follow-up ranged from one to 96 months (median 48 months). Three patients presented with stage IIB disease and underwent neo-adjuvant and adjuvant chemotherapy. Two patients presented with stage III disease and underwent lung metastasis resection in addition to chemotherapy and two patients presented with stage IA or IB disease and did not undergo chemotherapy. Fibula autograft reconstruction was performed in five cases, fibula allograft in two cases.

Results: No cases of local or systemic recurrence or infections were identified. One case of fibulo-capitate pseudoarthrosis was encountered which was revised with iliac crest bone grafting. One patient developed neutropenia and thrombocytopenia due to chemotherapy. At the time of most recent follow-up, high patient satisfaction was obtained in six patients.

Conclusions: Limb-salvage surgery for osteosarcoma of the distal radius can be effective when the treatment protocol consists of wide resection, skeletal reconstruction, and multidisciplinary oncologic management.

15:28 Discussion

15:31 **Use of Needle Biopsy to Establish Tissue Diagnosis of Peripheral Nerve Sheath Tumours**

Ms J Smith, Mr T Hems, Dr D Ritchie (Glasgow)

Introduction: Although most peripheral nerve sheath tumours (PNST) are benign, some are malignant. Effective surgical treatment of malignant tumours is facilitated by knowing the tissue diagnosis before operation. MRI and other imaging modalities give anatomical information but do not distinguish benign and malignant tumours. This study reviews experience of ultrasound guided needle biopsy of PNST since 2004. Previously excision biopsy was carried out on all suspected cases.

Material and Methods: This was a case note review. Seventeen patients who on clinical assessment and MRI had a swelling involving a major nerve trunk, had an ultrasound guided biopsy to obtain a 1mm core of tissue under local anaesthetic.

Results: One biopsy failed to obtain tissue from the tumour and one failed because of pain. Fifteen were successful and showed benign PNST in fourteen cases and one malignant PNST. One patient had a temporary radial nerve palsy following biopsy which resolved completely. Only two patients went on to have excision of benign tumour because of pain, the remainder being managed non-operatively.

Conclusions: Core needle biopsy appears safe and gives a tissue diagnosis in most cases of peripheral nerve sheath tumour, allowing surgical planning for malignant cases. Benign tumours could be managed conservatively, if this is acceptable to the patient, provided a tissue diagnosis has been made. This avoids potential complications of nerve surgery.

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- 15:36 Discussion
- 15:40 Presentation of Prize to the Best Candidate in BSSH Diploma Examination
- 15:45 Tea and Exhibitions
- 16:00 Choice of Excursions
- 18:00 End of Session

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07:30 Registration, Church House

**SCIENTIFIC PAPERS: DISTAL RADIUS
CHAIRMEN: DR S GLICKEL AND MR R ECKERSLEY**08:00 **The Anatomy of the Extended FCR Approach to Distal Radial Fractures**

Mr R Amirfeyz, Mr P McCann, Dr C Wakeley, Mr R Bhatia (Bristol)

Introduction: Fractures of the distal radius are one of the commonest orthopaedic injuries. Advances in implant technology have allowed surgeons to perform accurate reconstruction even after high energy intra-articular fractures through this volar approach. The aim of this study was to describe the exact position of the key soft tissue and neurovascular structures encountered (and hence at risk) during the extended FCR approach.

Materials and Methods: A series of one hundred consecutive adult MRI scans were reviewed. The relationships between the brachioradialis tendon (BR), flexor carpi radialis (FCR) tendon, flexor pollicis longus (FPL) tendon, median nerve and radial artery at the level of the distal radial physeal scar were measured in the axial plane using PACS (Fujitsu, UK) digital radiology viewing software.

Results: The male to female ratio was thirty-five:sixty-five. The average patient age was 39. The key findings were that the FCR tendon was 7.4mm (SD 1.46mm) from the radial artery and 7.0mm (SD 2.32mm) from the median nerve. The BR tendon was 9.8mm (SD 2.2mm) from the radial artery (median values). Kolmogorov-Smirnov statistical analysis showed the measurements did not follow a normal distribution.

Clinical Relevance: This study highlights the precise nature of the surgical anatomy involved in dissection to the fracture site. Vigilance is needed during the initial steps of the FCR approach to avoid damage to the radial artery and median nerve which lie in close proximity. In addition, we believe the BR tenotomy should be made under direct vision, given its relationship with the radial artery.

08:05 Discussion

08:08 **Investigation of Radio-lunate Relations in Normal and Fractured Wrists**

Mr M Broadbent, Mr I Stevenson, Mr C MacEachern, Professor A Johnstone (Aberdeen)

As the distal radius fracture is one of the most commonly encountered upper limb injuries, the aim of this study was to provide a quick and easy method to assess fractured wrists, both pre- and post-fixation, by utilising the relationship of the radial shaft and the lunate.

A retrospective analysis on one hundred consecutive patients with normal wrist radiographs was performed. The results demonstrated that the variations of radio-lunate anatomy followed a normal distribution. The normal anatomical relationship was then described.

A second part to the study consisted of reviewing our method of radio-carpal analysis on a small cohort of patients who had sustained a distal radius fracture. Carpal alignment pre- and post-fixation was measured, with the results demonstrating that by using this assessment method, it was possible with a quick glance of the radiograph, to determine whether satisfactory correction of the fracture had been achieved.

08:13 Discussion

08:16 **Carpal Malalignment in Malunion of the Distal Radius and the Effect of Corrective Osteotomy**

Professor L De Smet, Dr F Verhaegen (Pellenberg)

Introduction: Malunions of the distal radius are often accompanied with carpal malalignment. Two different types can be distinguished: an adaptive midcarpal malalignment (so called CIA wrist: carpal instability, adaptive) and a radiocarpal malalignment (dorsal translation of the whole carpus). The effect of distal radial osteotomy on the carpal alignment has hardly been studied.

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Material and Methods: Thirty-one wrists in 31 patients (mean age 44 years) with malunion of the distal radius after a Colles' fracture were treated with a corrective osteotomy. The patients were divided on basis of ERLF (effective radio-lunate flexion) in the two patterns of carpal malalignment. The radiographic changes were evaluated.

Results: There were twenty patients with midcarpal malalignment (ERLF = 25°) and 11 with radio-carpal malalignment (ERLF > 25°). There was a correction of radial tilt and ulnar variance in both groups. There was a significant improvement of the carpal alignment in the midcarpal malalignment group, up to normal parameters. Age or delay between fracture and osteotomy did not correlate. In the radio-carpal malalignment group a significant effect on the ERLF was observed. In the patients with dorsal plating 70% of the hardware had to be removed.

Conclusion: Distal radial osteotomy is a reliable technique for correction of the deformity at the distal end of the radius and carpal malalignment.

08:21 Discussion

08:24 **A Prospective Randomised Trial Comparing K-wiring with Volar Locking Plates for Distal Radius Fractures**

Mr J Field, Mr M Tredgett, Mr I McFadyen (Cheltenham)

Sixty patients with a Colles' type fracture of the distal radius (AO types A, B1 and B2 fractures) from the ages of 18-80 years, in whom conservative measures had failed, were randomised by computer to having treatment operatively with K-wires or a volar locking plate. Thirty patients were randomised in each group.

Patients were assessed radiologically at two weeks, three months and six months. Independent clinical assessments by physiotherapists were carried out at three months and six months assessing patients using the DASH scores, range of movement and for activities of daily living.

The volar locking plate group achieved better maintenance of fracture position, better range of movement, earlier return of movement, better function at six months and fewer complications, but the re-operation rate is higher in the DVRL group associated with distal screw mal-placement.

08:31 Discussion

08:34 **The Treatment of Dorsally Displaced Fractures of the Distal Radius: A Short-term Functional Outcome Study Comparing Volar 'Locking Plates' to Percutaneous Wires**

Mr M Breswster, Mr P Hull, Ms H Whalley, Dr M Gohil, Mr M Costa (Worcester)

Introduction: The optimal treatment method for dorsally displaced distal radial fractures remains controversial. There has been a recent expansion in the use of volar locking plates, although the evidence for the use of these plates is limited.

Method: We compared the results of seventy-one patients, all of whom had sustained a dorsally displaced distal radial fracture. Thirty-six of these were treated with volar locking plates at hospital A and 35 with manipulation and K-wiring at hospital B. The groups were non-randomised, however, during the study period hospital A had a hand surgeon, who treated all dorsally displaced distal radial fractures with a volar locking plate, whereas at hospital B no volar locking plates were available, and therefore all fractures were treated using K-wires. All patients were contacted between one and two years post-surgery and were scored using the patient rated wrist score (PRWE) and disability of the arm and shoulder (DASH) score.

Results: There was no significant difference between the groups in terms of demographics or grade of fracture. We found no significant difference between the groups PRWE or DASH scores at one - two years post-surgery.

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	Locking plate group (n=36)	K-wire group (n=35)	p-value
PRWE	27.7 (0-85)	32.2 (0-78)	0.437
DASH	19.0 (0-86)	25.3 (0-67)	0.106

Conclusion: The results of this trial do not demonstrate a superior outcome when using volar locking plates compared with MUA and K-wiring at 1-2 years post-operatively. A prospective randomised trial is urgently required, to determine the optimal management of this common injury.

08:41 Discussion

08:44 **Has Bone Augmentation a Substantial Effect in Fractures of the Distal Radius when Internal, Angle Stable Osteosynthesis is Used?**

Dr M Jakubietz, Professor J Gruenert, Dr R Jakubietz (St Gallen)

Background: Intra-articular distal radius fractures can be treated with many methods. While internal fixation with angle stable implants has become increasingly popular, the use of bone graft substitutes has also been recommended to address comminution zones. Whether a combination of both methods will improve clinical outcomes was the purpose of the study.

Methods: The study was thus conducted as a prospective randomised clinical trial. Thirty-nine patients with unilateral, intra-articular fractures of the distal radius were included and randomised to two groups, one being treated with internal fixation only, while the second group received an additional bone graft substitute.

Results: Both groups displayed a normal variance. There was no statistical significance between both groups in functional and radiological results. The bone-augmented group showed neither improved clinical nor radiological results. Secondary dislocations were evenly distributed among the groups with four in the augmented group and three in the non-augmented group.

Conclusions: No advantage of additional bone graft substitutes could be seen in this study. This study was designed that the only difference in the subgroups was the use of the bone graft substitute. Volar and radial inclination, ulnar variance and radial height were similar to the group without bone substitute. In this study additional bone augmentation showed no advantage over pi-plate fixation alone. With further development of angle stable implants, either volar or dorsal plates, it remains doubtful if bone grafting will have substantial effects on the outcome of distal radius fractures in the future.

08:51 Discussion

08:54 **If It Looks In is it Really In? Intra-Articular Screw Penetration of the Distal Radius - A Radiological Study**

Mr A Khan, Mr J Field, Mr M Tredgett, Dr R Powell (London)

Aim: Subtle intra-articular screw penetration of the distal radius during fracture fixation is difficult to determine using standard PA and lateral radiographs. The purpose of our study was to determine which radiographs most reliably identify penetration into the joint.

Methods: A distal volar locking plate was applied to an isolated radius bone and a series of plain radiographs taken. The radius, fixed along its long axis, was allowed to rotate through 180 degrees and inclined, in increments, to 40 degrees. In the control group the distal screws did not breach the articular surface. In the study group the screws penetrated the articular surface by 1mm. In each group sixty-five plain radiographs were taken and the presence or absence of screw penetration scored by two blinded observers.

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Results: Using Weighted Kappa analysis the overall inter-observer agreement for all views was 0.5 (CI 0.39-0.63). However in seven radiographs there was complete inter-observer agreement correctly identifying screw penetration of the articular surface. The articular surface was correctly identified as intact in thirteen views. Only a seventy-five degrees pronated view, without inclination, was 100% sensitive and specific for identifying the absence or presence of screw penetration through the articular surface.

Conclusion: The intra-operative use of a seventy-five degrees pronated view may reduce the need for repeated use of the image intensifier and excessive irradiation during plate fixation of distal radius fractures.

08:59 Discussion

09:02 **Outcome following Open Reduction and Internal Fixation using the Aculoc™ Plate for Fractures of the Distal Radius**

Miss D Wharton, Mr A Roche, Dr R Owen, Mr J Casaletto, Mr D Brown (Liverpool)

Introduction: Locking plate fixation of distal radius fractures is now an established and popular method of treatment. Reports show a variety of constructs used with varied results. This is the first patient series reporting the use and outcomes of the Aculoc™ plate.

Methods: Patients having fixation of distal radial fractures, using the Aculoc™ plate, under the supervision of a single hand surgeon during a twenty-month period, were included in the study. Complications were recorded and patients were followed up using radiographs, to assess radial inclination, dorsal tilt and radial length (by 2 observers). 'Disabilities of the Arm, Hand and Shoulder' (QuickdASH) questionnaires were used to assess function, and VAS scores completed for pain and overall satisfaction.

Results: Fifty-seven patients were studied (30 female, 27 male), including two patients with bilateral injuries, giving a total of 59 fractures. AO classification was used. The mean age was 51.5 years (range 19-82). Function scores were taken at a mean follow-up of 17.3 months. Mean QuickDASH score was 10.2 (range 0-60, standard deviation 15.0), and the mean pain score was 1.58 (0-10 scale). Fifty-two patients were either satisfied or very satisfied with their outcome. Six patients developed complications requiring plate removal. Student's t-test showed no significant difference between immediate post-operative and follow-up radiographs.

Conclusion: The Aculoc™ plate provides a stable method of fixation for treatment of distal radius fractures, allowing minimal loss of anatomical surgical reduction. Overall functional outcome following this method of treatment was excellent in most patients with a low complication profile.

09:07 Discussion

09:10 **High-Resolution Ultrasonography of the Hand and Wrist**

Mr J Chan, Mr R Choa, Dr D Chung, Mr G Sleat, Miss G Smith (Aylesbury)

Introduction: Ultrasonography (US) has gained popularity with the advent of high-resolution transducers. There is little published literature supporting its use in the hand/wrist. Previous studies have assessed the diagnostic accuracy of US hand/wrist, but ignored its use in excluding diagnoses. To our knowledge, this study represents the first to assess its 'usefulness' in contributing to patient management using a rating system.

Methods: Retrospective analysis was carried out on two hundred and twenty-seven patients over a three-year period. The provisional diagnosis, US findings and final diagnosis, as established by surgery, histopathology, or further investigation and follow-up, were recorded. Usefulness of US was assessed in each case by two authors independently as: (1) Useful - determines management, (2) Useful - contributory, (3) Not useful but not misleading, and (4) Not useful - misleading and potentially harmful.

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Results:

	Useful – determines Mx %	Useful – contributory %	Not useful – not misleading %	Not useful – misleading %	Total number of cases
Tendinopathy	42.3	25.0	15.4	17.3	52
Lump	28.9	44.4	15.6	11.1	45
CTS	65.7	2.9	17.1	14.3	35
Joint	56.0	36.0	8.0	0.0	25
Tenosynovitis	42.9	28.6	0.0	28.6	14
Others	25.0	62.5	0.0	12.5	7
FB	85.7	0.0	0.0	14.3	5
Collection	80.0	20.0	0.0	0.0	4
Neuroma	25.0	50.0	0.0	25.0	2
No Prov Dx	100.0	0.0	0.0	0.0	1
Ligament	0.0	0.0	0.0	100.0	8
Overall	47.0	27.8	12.1	13.1	198

US Hand/wrist was useful in 74.8 % of cases but misleading and potentially harmful in 13.1 % of cases.

Conclusions: US is an useful imaging modality, especially for assessment of collection and joint pathology. It is helpful in assessing tendinopathy, carpal tunnel syndrome, foreign body and lumps, but misleading rates of > 10 % are worrying when US findings may influence the decision to operate.

US hand/wrist is operator-dependent and has a steep learning-curve. Specialist musculoskeletal radiologists are essential in improving hand services.

Presence of an experienced Hand Surgeon may aid in assessing complex dynamic studies.

09:17 Discussion

09:20 **“Pyrodisc” Arthroplasty of the Arthritic Thumb Basal Joint: A New Trapezium Sparing Procedure with a Two-year Follow-up of Forty-seven Patients**

Dr C Hamlin (Denver, CO)

The thumb carpometacarpal, (CMC), joint occupies a prominent place in the lexicon of hand problems. Since 1949, when Gervis in the British literature and Stark in the American literature offered trapezium resection and basal joint arthrodesis, respectively, as solutions for this problem, many procedures have been proposed. A great many of these include trapezium resection. Yet recently there has been considerable interest in saving the trapezium to avoid thumb shortening and weakness. In addition, preservation of the trapezium allows greater salvage opportunities should any problems arise.

This author and Ascension Orthopedics of Austin, Texas have designed an inter-positional disc made of pyrocarbon which preserves trapezium bone stock and retains free rotational motion of the thumb.

The author presents a two-year follow up of forty-seven “pyrodisc” arthroplasties of the the thumb CMC joint. The surgical technique will be presented. Critical evaluation of pain relief, pinch strength, functional activities and preservation of thumb length are offered in introducing a new procedure to this audience. Results appear to compare most favorably with alternative procedures.

09:25 Discussion

09:28 **Central Axis/Anatomically Designed Radial Head Prosthetic Arthroplasty**

Dr S Payvandi, Dr W H Seitz, Jr, Dr J Jeong (Cleveland)

Replacement arthroplasty of the radial head is indicated when fracture, deformity and/or arthrosis of the radiocapitellar joint is accompanied by posterolateral or axial instability. Collateral ligament instability derived from trauma or longstanding attenuation in conjunction with loss of axial support results in instability of the elbow and dysfunction. In the face of trauma, restoration of columnar support at the radiocapitellar joint relies on the ability to reconstruct the radial head and neck. When this is impossible or following a failed attempt to do so, the result is pain, dysfunction and loss of control. With loss of the

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interosseous ligament, integrity longitudinal instability results in dysfunction more distally at the wrist as well as instability at the elbow. Silastic prosthetic replacement has been shown to be inadequate while soft tissue reconstruction alone is both difficult and unpredictable. Restoration of columnar support through replacement of the radial head has been effective in restoring stability but has relied upon standard-sized prostheses, which do not always conform with anatomy. The authors have developed a radial head prosthetic system which closely approximates the native anatomy in terms of intramedullary fit, re-establishment of radial head height, and diameter accommodation to be able to adequately close soft tissue capsular and ligamentous structures without “overstuffing” the proximal radioulnar joint. The modular implant utilises the concept of a central axis of forearm pronation and supination establishing a neck cut perpendicular to this long axis rather than perpendicular to the anatomic neck. This allows the replaced head to sit opposed to the capitellum at all times during pronation and supination. The radial head itself is sized to restore appropriate length longitudinally but is downsized at least 2mm to allow adequate soft tissue closure, preventing overstuffing. A variety of sizes of stem and head length and width are provided in the “emergency trauma tray” with spacer rings of 1mm and 2mm to provide up to the 3mm additional length as needed. For reconstruction cases, custom implants are measured and designed through markers placed on standardised X-rays and are constructed within five working days to provide an anatomic replacement exactly fitting the patient’s anatomy. The prosthetic head is easily removed from the stem for trial and sizing purposes. Each implant comes with its own set of instruments for exposure, broaches and inserters.

Twenty-three patients with both acute and chronic pathology at the proximal radio-ulna and radiocapitellar joints with instability have been managed with this anatomic modular system. No patients have required revision. All have remained stable and pain relief has been significant with a decrease on a pain visual analog scale from an average of 8.5 to 1.2 and an increase in the arc of pronation and supination from 50° to 160°. There have been no infections. One patient has shown some lucency about the radial stem but clinically has had no symptoms of pain, instability or loosening.

This system which attempts to recreate functional anatomy has proven to be effective in restoring stability while simplifying the surgical technique through use of user-friendly implants and surgical instrumentation.

- 09:37 Discussion
- 09:40 **INVITED LECTURE: “Happy Birthday, Gray’s Anatomy”**
Dr A E Flatt
- 09:50 Coffee and Exhibitions
- 10:20 **SYMPOSIUM: SMALL JOINT ARTHROPLASTY**
Chairmen: Dr J Slade and Mr P D Burge
- Finger Proximal Interphalangeal Joint
Mr D Warwick
 - Finger Metacarpophalangeal Joint
Dr C Rodner
 - Wrist Joint
Mr I A Trail
 - Distal Radio-ulnar Joint
Dr D Dennison
 - Trapeziometacarpal Joint
Dr F Leversedge
- 12:00 Close of Meeting
- 12:45 - 17:00 Tour of Westminster Abbey and Visit to the London Eye

Sunday, 3 May

Greenwich by boat from Westminster – leave approx 11 am: to include Observatory, Maritime Museum, Queens House, Old Royal Naval College. Time at Greenwich Market.

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- 1 **Re-operation for Carpal Tunnel Syndrome: An Audit of Four Years of Revision Decompressions**
Mr R Chennagiri, Mr B Dean, Mr P Burge (Oxford)

Introduction: Recurrence of symptoms after carpal tunnel decompression is uncommon but its management is difficult and the outcome may be suboptimal. We analysed cases in which recurrence required a second decompression, to identify the causes of recurrence and to use this information to minimise future recurrences.

Patients and Methods: All cases of recurrent carpal tunnel syndrome treated surgically at our hospital between August 2003 and September 2007 were analysed retrospectively. The cause of recurrence was subdivided as follows: incomplete release of the distal volar forearm fascia (DVFF), incomplete release of the flexor retinaculum, fibrosis of the flexor retinaculum, flexor tenosynovitis and unknown.

Results: Fifty-one revision decompressions were performed over the four-year period. Thirty-five were revisions of primary decompressions carried out at our hospital. During this period, we performed one thousand eight hundred and twenty-six primary decompressions. The causes of recurrence are documented in the table below.

Cause of recurrence	Number of cases
Fibrosis of flexor retinaculum	32
Incomplete release of DVFF	9
Incomplete release of flexor retinaculum	6
Flexor tenosynovitis	4

Cases of incomplete primary release were significantly more likely to have experienced no relief of symptoms after the primary decompression ($p=0.012$ Fisher's exact test). Cases of incomplete primary decompression had persistent symptoms or a short period of remission (median one month) whereas the symptom-free interval was longer in cases of fibrosis (median 18 months).

Discussion: This study points to the importance of adequately releasing the DVFF during carpal tunnel release. However, the cause of the fibrotic reaction that is seen in many cases of recurrent carpal tunnel compression remains unclear.

- 2 **Minimising Delay to Theatre for Open Hand Injuries: The Value of Dedicated Hand Trauma Lists**

Dr A Goodson, Mr K Sarraf, Mr S Kumar, Dr S Parkar, Miss K Owers (London)

Introduction: BSSH guidelines recommend that open fractures/joints, vascular compromise, bites and badly contaminated wounds receive surgery within twelve hours and all other open hand injuries within 48 hours of injury. In 2007, we audited our adherence to these guidelines and found that only 68% of open injuries met this standard. As a result we were able to increase the ratio of dedicated hand trauma general/regional (GA) lists to local anaesthetic lists from 7:3 to 9:1.

Methods: Following this change we re-audited our practice, using prospective data collection over a one-month period.

Results: We identified eighty-four cases of open hand trauma. We excluded cases with insufficient data (7) and those who presented to our unit >48 hours from injury (12). 56/65 (86%) cases received surgery within 48 hours - 46/55 (84%) adults and 10/10 (100%) children. Of these, there was one urgent case, which received surgery 45 hours from injury due to delay in presentation (23 hours). Three other urgent cases were excluded due to later presentation but all received surgery within 12 hours of presentation to our unit.

Conclusions: Increasing dedicated GA theatre lists is associated with improved delivery of open hand trauma care. In this audit, 18% more cases received surgery within 48 hours of injury (31% more adults). However, we are not yet fully compliant with BSSH guidelines. To improve, we are planning a further increase in dedicated GA lists. We also recommend increasing awareness of these guidelines amongst referring hospitals and discuss methods of achieving this.

POSTERS**3 Pyrocarbon Proximal Interphalangeal Joint Arthroplasty: Outcome Audit in the Patients' Environment**

Dr M Ng, Mr J Clarkson, Mr A Wilmshurst (Dundee)

Aim: To evaluate the objective and subjective outcomes of pyrocarbon proximal interphalangeal joint (PIPJ) replacement, using visits to the patients' own homes.

Methods: A retrospective audit of PIPJ arthroplasties performed by the senior surgeon was carried out, with a minimum follow-up interval of six months. Patients were visited at home, examined clinically and given questionnaires to fill in.

Results: Fifteen joints in 14 patients (12 female, 2 male) were included, with a mean follow-up time of 27.4 months (7-44 months). The mean age at operation was 62.5 years (38-82 years). The main indication for the procedure was pain. The patients had osteoarthritis (7), rheumatoid arthritis (4) or post-traumatic arthritis (3). Eleven patients returned to work or resumed their hobbies. Complications were stiffness, instability and subluxation of the prosthesis. Infection and wound healing problems were not reported. Post-operatively, the range of movement improved and grip and pinch strength was reduced. Radiographs were in keeping with the manufacturer's description of lucent zones. Pain was reduced and patients were satisfied with the procedure. The evaluation at home yielded qualitative and quantitative data unavailable at an outpatient clinic. The home visits provided an invaluable insight into the impact of the procedure on the patients. Outcome data are presented.

Conclusion: Home visits provide a useful insight into the overall function of patients after joint reconstruction in the hand.

4 An Audit of the Coding System at the Chelsea and Westminster Hospital Hand Surgery Unit

Mr M Rance, Mr D Atherton, Miss A Bremner-Smith, Miss B Jemec (London)

Introduction: The introduction of Payment By Results into the National Health Service has had a profound effect on the way healthcare is provided in the UK. Today specialties who wish to excel may feel pressure to ensure they are perceived as cost-effective when it comes to allocation of resources by the Trust. To do so it is important to ensure workload is appropriately financially reimbursed and this process is dependant on accurate coding.

Methods: We performed an audit to assess the coding system at the Chelsea and Westminster Hospital Hand Surgery Unit. Eighty-three sets of coded patients' notes were reviewed. The codes that had been assigned by the Trust Coding Department for the diagnosis, procedure and final 'Healthcare resource group (HRG)' were noted.

Results: In our opinion 38.5% of the cases had received 'incorrect coding' for at least one aspect of the diagnosis or procedure. After correcting the codes there was, however, no change to the final HRG code in the majority of cases implying that there would be no change to the funding received by the trust.

Conclusion: This audit shows that there is significant potential for error in the current coding system. It also raises questions about the specificity of HRG codes and accuracy of financial remuneration for individual procedures. We feel that in the modern NHS it is important for departments to take an active role in monitoring the coding process to ensure appropriate financial reimbursement for workload and to encourage satisfactory resource allocation by their Trust.

5 Outcomes of Proximal Interphalangeal Joint Arthrodesis

Dr M Sommerlad, Mr P Johnston, Mr A Chojnowski, Dr N Asif (Norwich)

Introduction and Aims: Proximal interphalangeal joint (PIPJ) arthrodesis is used to restore hand function and relieve chronic pain in arthritic, unstable joints. The purpose of this study was to review the fusion angles and outcomes of patients who had PIPJ fusions.

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Material and Methods: We retrospectively reviewed eighteen patients with 23 PIPJ fusions, carried out from January 2005 to December 2008. Six patients had rheumatoid joints, 3 patients had non-traumatic osteoarthritis and 6 patients were post-trauma. One patient had chronic joint instability, one had unexplained joint contracture, and a further patient had chronic regional pain syndrome resulting in PIPJ fixed flexion deformities. Three index fingers, 1 middle, 11 ring and 8 little fingers were fused. Three joints were fused using plates, and the remaining twenty joints were fused using tension band wiring.

Results and Statistics: Average angles of fusion were: Index - 25° (range 5-42°), Middle - 38°, Ring 41° (20-64°) and Little 43° (29-58°). Twenty joints were confirmed radiologically fused with an average final follow-up of 9 months (1.5-39 months). Two joints failed to fuse and had revision fusion using plates. One patient was lost to follow-up. Four patients had their metalwork removed due to discomfort. One patient with a post-traumatic PIPJ fusion had digital amputation for chronic pain and loss of function. In patients where pre- and post-op DASH scores and grip/pinch strength were recorded, there was no significant change.

Conclusions and Clinical Reference: Tension band wiring is shown to be an effective method of PIP arthodesis, with AO plating used for failed fusions.

6 Ulnar Derotation Osteotomy to Stabilise Chronic Dynamic DRUJ Subluxation

Dr E P Askouni, Miss K Owers (London)

We present a thirty-year old right hand dominant trainee solicitor, who sustained an injury to her left wrist 15 years ago. She described a fracture which was managed with manipulation and plaster. Since then, she has had increasing problems with her left wrist and in the last five years she has found it difficult to drive because of severe pain. On examination, there was an abnormal contour of the wrist with partial subluxation of the ulna head on pronation and full subluxation on supination. Radiographs showed a 15° dorsal angulation of the radius at the diaphyseal-metaphyseal junction. A CT scan of both wrists in pronation, supination and neutral confirmed that the ulna head subluxed volarly on full supination. There was also some early degenerative change, but a good sigmoid notch, on the radius. There was a 30° difference in rotation between left and right ulna heads. Therefore, a 30° ulnar derotation osteotomy was carried out. Three months post-operatively she had an excellent range of painfree motion (85° dorsiflexion, 45° palmarflexion, full pronation and full supination) with no subluxation of the DRUJ. Clinical photos, pre-operative planning and post-op CT scans are demonstrated. In addition, the available literature regarding the management of this challenging condition is discussed.

7 The Peril of Overstuffing: Capitellar Wear following Radial Head Arthroplasty

Dr L Katolik, Dr R Culp (Philadelphia)

Two cases of marked capitellar wear following radial head arthroplasty are presented. The clinical implications of oversizing radial head implants is discussed. Technical guidelines for the prevention of lateral compartment “overstuffing” are presented.

8 Spontaneous Dislocation of the Trapeziometacarpal Joint: A Case Report

Mr S Muthian, Mr W Samuel (Winchester)

Introduction: Thumb carpometacarpal dislocations are very rare and usually follow trauma. The strong volar (oblique) ligament usually produces an intra-articular avulsion fracture, rather than a pure dislocation.

Case: We report a case of spontaneous dislocation of the carpometacarpal joint of the thumb with no history of trauma in a sixty-one year old lady, who presented with ongoing thumb pain and deformity in her dominant hand for nearly two years. There was clearly no history of any trauma at any point. She was fit and well and had no co-morbid conditions, including diabetes or gout.

On examination she was found to have a deformity at the base of her thumb and tenderness at the site. Radiographs showed a complete dislocation of the trapeziometacarpal joint. She underwent surgery through a volar approach and the trapezium was excised in a single piece and the thumb was repositioned and K-wired. The trapezium was found to have an extremely worn out joint surface, which was rendered deeply

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concave by the metacarpal base (pictured surgical specimen). The K-wire was removed at three weeks and she regained full function of her hand within the next six weeks after attending hand therapy.

Discussion: Spontaneous dislocation of the thumb carpometacarpal joint is not a well-recognised entity and we report this case to bring attention and to highlight the importance of treatment, including temporary stabilisation of the thumb in cases of gross deformity.

9 **Multiple Giant Cell Tumour of the Tendon Sheath**
Mr T Singh, Mr S Noor, Mr A Simons (Birmingham)

We present an unusual case of simultaneous multiple giant cell tumour of the tendon sheath (GCTTS) in a thirty-seven-year old tree surgeon. GCTTS is a common soft tissue tumour in the hand. However, multiple simultaneous lesions are extremely rare. This patient initially complained of pain in the region of the base of the ring and little fingers. A month later, he developed two soft tissue swellings at the base of the little finger and a soft tissue mass in the center of the palm relating to the left ring finger. A Magnetic Resonance Imaging (MRI) scan suggested multiple GCTTS of a single tendon sheath. These masses were excised completely without MRI evidence of a recurrence. Multiple GCTTS should be a differential diagnosis of multiple soft tissue swellings in the hand with an MRI scan and complete excision being the appropriate imaging and treatment modality respectively.

10 **Delayed Presentation of Ulnar Nerve Motor Branch Palsy following Fractures at the Base of the Fifth and Fourth Metacarpals**
Dr R Sullivan, Ms K Owers (Bath)

We present a twenty-six-year-old graphic designer, who presented four days after a fall onto his dominant right hand. X-rays identified an undisplaced fourth metacarpal fracture and a displaced fracture of the base of the fifth metacarpal. On examination of the hand there was no deformity, full range of pain free movement and normal motor power and sensation. Treatment was conservative in an ulna gutter splint. Six weeks after injury, the patient noticed clawing of the ring finger and weakness of pinch. On examination, there was marked ring finger clawing with 0/5 power of adductor pollicis, abductor digiti minimi and palmar and dorsal interossei. Sensation was intact and Tinel's test negative. MRI showed a haematoma in the region of the deep motor branch of the right ulnar nerve. Nerve conduction studies confirmed a partial axonotmesis lesion. At surgery, a tight band was found compressing the motor branch of the ulnar nerve at the opponens digiti quinti arcade. No bone spike or haematoma was involved. All fascia was released, freeing the nerve from the tight canal. The motor branch was dusky at the proximal end of the canal suggesting this was the site of compression. The patient underwent early active mobilisation in a splint post-operatively. Six weeks later he had regained full power and the clawing had resolved. We suggest that symptoms developed in our patient due to an anatomical variant combined with a traumatic precipitant. Clinical imaging is illustrated and literature regarding injury and management of this challenging condition are discussed.

11 **Anatomical Considerations in a Retrovascular Approach to Dupuytren's Fasciectomy**
Mr S Lo, Mr M Pickford (London)

Limited fasciectomy has undergone few modifications since it was popularised by Hueston in 1961. The key to safe dissection is adequate exposure of the neurovascular bundle, which is traditionally performed in a proximal to distal manner, and superficial to deep through the affected cords.

Here we describe an approach that aims to sidestep the tedious axial dissection of the neurovascular bundle by approaching the disease from its undersurface. This approach exploits two patho-anatomical characteristics of Dupuytren's disease. Firstly, the disease is rarely retrovascular and therefore dissection from its deep surface theoretically allows unfettered access to the neurovascular bundle. Secondly, the disease usually exhibits a unilateral pre-disposition with respect to the axis of any affected digit. This allows access from the less affected side in order to 'flip' the diseased tissue, thereby exposing the retrovascular surface. Hence, the term 'soft under-belly' approach (SUB) has been used in regard to this dissection.

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Advantages of the ‘Soft Under-Belly’ Approach: The perceived advantages of this technique are three-fold. First and foremost, a retrovascular exposure allows access to the neurovascular bundle via the thinnest plane of dissection. This also allows visualisation of neurovascular bundle along its entire length, and a relatively easy and atraumatic plane of dissection. Secondly, inadvertent damage by excessive blunt axial dissection of the neurovascular bundle is avoided. Thirdly, due to the nature of the exposure, retrovascular disease is always identified in the dissection and appropriately managed.

12 Surgical Exposures of the Traumatized Hand: A Patient Perspective on Aesthetic Outcome

Mr A Abood, Dr G Orfanotis, Mr J Zhong (New York)

Background: The management of hand trauma forms a substantial workload for the majority of plastic surgical units. Despite many publications on the numerous exposures of traumatized digits, little is known about patients satisfaction with the scars which they leave.

Methods: One hundred consecutive pre-operative acute hand trauma patients were surveyed following admission to the plastic surgical ward at Bradford Royal Infirmary. They were presented with a questionnaire that included photographic representations of three commonly used scar patterns arising from surgical exposure. The patients were asked to score their preference, based upon aesthetic appearance alone, of the scar patterns demonstrated (Brunner, Modified Brunner and Mid-lateral).

Results: The study group consisted of one hundred patients. There were seventy-seven men and twenty-three women, age range was from fifteen to eighty-eight years (average age = 37.56). A comparison of rankings was made using the Chi-squared test. Sixty-nine patients (69%) ranked the mid-lateral incision as the most aesthetically pleasing ($P < 0.001$), eighteen (18%) ranked the Brunner incision as most aesthetically pleasing. Thirteen patients (13%) ranked the Modified Brunner as their first choice. Fifty-nine patients (59%) felt the modified Brunner incision had the least aesthetically acceptable appearance.

Conclusion: The diversity of every digital injury ensures that no single approach suits all. The results from this survey allow the surgeon to consider the potential aesthetic outcome a little further.

13 Identification of a Ruptured Ulnar Collateral Ligament on Plain X-ray

Dr S Hindocha, Mr H Tehrani, Miss L Feldberg (Manchester)

Case Report: A fifty-one year old lady presented to the hand trauma team with a three-month history of right thumb pain, stiffness and reduced range of movement. There was a history of injury to the thumb, where a description of catching the thumb in a horse stirrup, resulting in a stretching injury at the proximal inter-phalangeal joint (PIPJ). On examination the thumb appeared swollen at the PIPJ. There were no breaks in the skin nor any evidence of erythema. On the X-ray of the thumb a lesion was identified on the ulnar aspect of the PIPJ. Exploration of the lesion revealed a detached ulnar collateral ligament. Follow-up X-rays revealed that the lesion was no longer visible.

Discussion: The commonly described Stener lesion can be identified on plain X-ray. This case report describes identification of a ruptured collateral ligament on plain X-ray in the absence of a fracture. Rupture of the ulnar collateral ligament is commonly seen with a fracture in approximately 25% of cases. In the absence of bony abnormality on the X-ray, an ultrasound scan is sometimes carried out in those with persisting symptoms. This can delay operative management and result in further disability and pain for the patient. We suggest that actively searching for a ruptured ulnar collateral ligament on X-ray may prevent delay in operative management and therefore improve patient outcome.

14 Short Term Results of Giddin’s Frame Application in Management of Comminuted Intra-Articular Base of Phalanx Fractures

Mr M Mansha, Mr M Al-Maiyah, Mr S Miranda (Middlesbrough)

Introduction: Treatment for the comminuted intra-articular fractures of base of phalanges remains a challenging problem in hand surgery. The outcomes are commonly associated with pain, stiffness, chronic instability and degenerative arthritis of proximal interphalangeal (PIP) joints. We present our short-term results in twelve consecutive patients suffering from these complex fractures, treated by closed reduction and application of a dynamic external fixator (Giddins’s frame).

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Methods: All patients presenting to the finger fracture clinic with a fracture of the base of the phalanx (Pilon fracture) from September 2006 to May 2008, who required surgical intervention, were included in this study. All included fractures were comminuted and longitudinally unstable with joint subluxation.

Results: A total of twelve patients (6 retrospective and 6 prospective), 7 male and 5 female were treated with this method over this period. Eleven patients had comminuted fractures of the base of the phalanx, involving PIP joints and one with IP joint of the non-dominant thumb. The average range of movement achieved was 11-86 degrees and there were no serious complications. We used the construct with slight modification and in our experience this may be helpful to reduce the pin site infection. Early return to work, good pain relief and high level of patient satisfaction was achieved.

Conclusion: Based on our experience we recommend this easy technique to treat these complex fractures of IP joints. It is relatively simple, uses widely available equipment (K-wire) and compact, thus allows more than one finger to be treated

15 **Early Outcomes of a New Technique for Open Reduction of Mallet Fractures**
Mr J Phadnis, Mr S Yousef, Dr A Saad, Mr R Chidambaram, Mr D Mok (London)

Introduction: We present a new technique for fixation of mallet fractures, which provides anatomical reduction and allows early mobilisation of the digit.

Method and Surgical Technique: Open reduction, using two convergent 0.6mm Kirschner wires, is performed after stabilisation of the distal interphalangeal joint in extension using a larger obliquely orientated wire. Mobilisation of the rest of the digit is commenced immediately and all wires are removed at six weeks. A retrospective outcome analysis of all patients was performed, utilising clinical, radiological and lifestyle parameters.

Results: Twenty patients underwent fixation between September 2007 and October 2008. Fifteen were male and five female. Mean age was 26.1 years (15-62 years). Mean time to surgery was nineteen days (6-25 days). Mean follow-up was at 23.4 weeks (12-66 weeks). Pre-operative classification using the Webhé and Schneider system showed eleven fractures were type 2B, 5 type 2C and 4 type 1B. According to Crawford's evaluation criteria outcome was excellent in five patients, good in 10, fair in 4 and poor in one. 100% of patients returned to work and 95% to recreational activities without problems. 90% were satisfied with their outcome. Radiographs showed 100% fracture union, and articular step off less than 2mm in four patients. This was associated with poorer outcome. Shorter time to surgery was associated with a better outcome.

Conclusion: Surgical treatment of mallet fractures by this technique yields good results, which we attribute to anatomical, stable fixation and early mobilisation.

16 **A Classification System for Elastic Band and Ring Erosion of the Digits**
Mr S Saour, Mrs P Mohanna, Mr M James (London)

Introduction: Constriction of digits by rings, rubber bands and hair have been reported in the literature and can affect any age group. Presentation is variable both in respect of timing and severity of the injury.

Case Report: We present a sixty-three year old lady with a two-year history of a non-healing wound to the dorsum of her left ring finger proximal phalanx. An X-ray demonstrated erosion of the underlying proximal phalanx. Surgical exploration revealed an elastic band which had eroded through the extensor tendon and into the proximal phalanx.

Conclusion: The severity of these injuries is variable and depends on the duration of application of the elastic band. We suggest a classification system for the description of such injuries.

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Type 1: Partial skin erosion

Type 2: Complete skin erosion

- a) No other injury
- b) Tendon injury
- c) Nerve injury
- d) Bony erosion

This case serves as a reminder of the importance of ensuring that all elastic bands or tourniquets applied to digits or limbs are removed at the end of the surgical procedure. In addition when faced with a non-healing wound on a digit with tendon, nerve or bone injury one should suspect a foreign body causing constriction.

17 **Buttress Plating for Unstable Dorsal Fracture Dislocation of the Proximal Interphalangeal Joint**
Mr T Singh, Mr A Lakdawala, Mr V Rajaratnam, Mr D Power, Mr M Craigen (Birmingham)

Introduction: Dorsal fracture dislocation of the proximal interphalangeal joint (PIPJ) is usually a result of hyperextension and axial compression. These injuries can be difficult to treat and often result in long-term pain, functional deficit and stiffness. We have used a 1.3mm cage plate for fixation of these fractures by volar approach, following an open reduction.

Methods: We reviewed eleven patients who had buttress plating for PIPJ fracture dislocations. Clinical assessment was made using the Quick-DASH score. We measured range of movement of the MCPJ, PIPJ and DIPJ and documented any post-operative complications. Post-operative X-rays were obtained to assess joint congruency and the presence of articular step-off deformity.

Results: The mean age was 35.6 years and the mean follow-up was 15.1 months. The mean MCPJ flexion was 86.9 degrees. The mean PIPJ flexion was 80.3 degrees. The mean flexion of the DIPJ was 69.4 degrees. All fractures had united on the final follow-up. Congruent articular surfaces were achieved. The mean Quick-DASH score was 12.9. Five out of 11 (45%) had metalwork removed, arthrolysis and flexor tenolysis carried out for stiffness. One patient had a superficial infection that settled with oral antibiotics.

Conclusion: The major advantage of this technique is that the plate produces a buttressing effect of the fracture fragment and helps maintain joint congruity in order to achieve early protected mobilisation. Post-operatively some patients do develop adhesions of the flexor tendon leading to joint stiffness. This often warrants arthrolysis, flexor tenolysis and removal of metal work as a second stage procedure.

18 **Repair of Lacerated Peripheral Nerves with Nerve Conduits**
Dr J Taras, Dr C Lincoski, Dr S Jacoby, Ms P Steelman, (Philadelphia, PA)

Introduction: Bovine collagen nerve conduits effectively treat lacerated digital nerves. Nerve repair with biodegradable nerve conduits has the theoretic advantage of allowing tensionless repair, while providing an optimal environment for nerve regeneration. Many different materials have been researched, but there are no known human clinical trials of purified type I bovine collagen nerve conduits.

Materials and Methods: We report a prospective review of twenty-two digital nerve lacerations treated with a bioabsorbable collagen nerve conduit. Average nerve gap measured 12.65 mm. Evaluation was performed using static two-point discrimination, moving two-point discrimination, visual analog pain and global function assessment. Follow-up was performed throughout the post-operative period with final follow-up averaging 16.6 months.

Results: Average S2PD at final follow-up was 6.86mm and average M2PD was 5.81mm. S2PD and M2PD in the unaffected digit and contralateral unaffected nerve in the affected digit averaged 3.96mm and 3.55mm respectively. Excellent results (M2PD less than or equal to 4mm and/or S2PD less than or equal to 7mm) were achieved in 59 percent and good results (M2PD of 5-7mm and/or S2PD of 8-15mm) in 23 percent and poor results (M2PD of 8 or greater) in 18 percent. Noticeably decreased visual analog pain levels were observed shortly after surgery.

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Conclusions: When compared with similar reports of non-collagen nerve conduits, results of isolated digital nerve lacerations treated with bioabsorbable collagen nerve conduits are similar. Further, our results with bovine collagen nerve conduits are superior to nerve grafting when compared with other series.

19 **The Efficacy of Steroid Injections for Trigger Finger**

Dr B Dala-Ali, Miss A Lloyd, Mr A Nakhdjevani (Stevenage)

Introduction: A retrospective study was carried out to investigate the efficacy of injecting triamcinolone into the A1 pulley in the treatment of trigger finger.

Method: We reviewed all the steroid injections administered over a three-year period. This included ninety cases with at least two months of follow-up. The study considered the efficacy of the injections, as well as any correlation with:

- severity at presentation (using Quinell's classification),
- co-morbidities,
- actual digit injected.

Results: The study found that thirty-eight percent of trigger fingers were effectively treated with one injection. A second injection raised these figures to 70%. A third and final injection only raised these figures to 71%.

Efficacy was reduced in patients with diabetes (62%) and increased in those with osteoarthritis (75%). The efficacy was much higher when treating the thumb (96%) compared to the other digits. The efficacy with regard to the severity of the condition can be seen in Figure 1.

Figure 1

Severity	Grade 1	Grade 2	Grade 3	Grade 4
Efficacy of steroid injection	76 % (35/46)	71 % (15/21)	72 % (8/11)	66% (2/3)

Conclusion: Steroid injections are an effective treatment for trigger finger. However, as there is limited value in the third injection, it is proposed that surgery should be utilised after two attempts. This study was consistent with other research in showing that pre-existing diabetes may reduce the efficacy of this treatment. It is also of note that the digit affected may have an impact on the success of the treatment.

20 **Protection of Protruding K-Wire Ends: The Chiroklip**

Mr S Muthian (Winchester)

Introduction: K-wire fixation is a common method of treatment for fractures of the hand and wrist. Peri-operative injuries from the sharp ends of the K-wire are a potential threat to the safety of the surgical team. Traditionally, various precautions have been advocated to protect the protruding end of the K-wire post-operatively, including the use of tapes, corks, rubber stoppers, epoxy putty, plastic caps, k-balls and double bending and burial of tip. This is a report on a new and simple technique, which protects the protruding end of the K-wire and it can also be used as a temporary wire protector intra-operatively.

Chiroklip: The Chiroklip is a sterile, disposable butterfly-shaped flat piece of aluminium with smooth rounded edges and adhesive coating on one side, covered with a non-stick film. The K-wire is bent and cut in a routine manner and the adhesive surface goes onto the K-wire and the wings of the chiroklip are then brought together, enclosing the sharp end of the K-wire inside the two adhesive surfaces. The Chiroklip can also be used to remove the K-wire without the use of any equipment, as it securely grips the bent end of the wire. In this hospital, this device has been used in over two hundred cases without any adverse effects. This sterile, specifically designed device is cheap and easy to use in practice.

POSTERS**21 Modified Joystick Technique for Scapholunate Reduction**

Mr S Muthian, Mr W Samel (Winchester)

Introduction: Scapholunate ligament injury is a significant injury, resulting in high morbidity if left untreated. Traditionally, the joystick technique using K-wires has been used to reduce the scaphoid and lunate and hold them in good rotatory alignment while stabilisation is carried out. Restoration of the scapholunate angle is necessary to restore neutral wrist mechanics.

Technique: The use of K-wires for reduction has limitations when the bone is osteoporotic or small, where the K-wire has a very small purchase in the bone. This limits the quality of the angular reduction possible. Further, in cases of lunate or perilunate dislocation, a strong hold in the bone is required to achieve a good correction. In such cases, we use a small fragment AO cortical screw inserted into the non-articular area of the lunate (pre-operative photograph enclosed). This gives a much better hold on the lunate and enables quicker reduction with better scapholunate angles. If required, a similar small fragment screw can be inserted temporarily through the non-articular part of the scaphoid.

Discussion: This modified technique of scapholunate reduction, used appropriately, would result in less operating time and better quality of reduction during scapholunate reduction.

22 EPL Attrition Rupture following Bone Harvesting from Lister's Tubercle

Dr G Singh Pahal, Mr J Colville (London)

Introduction: Extensor Pollicis Longus (EPL) tendon rupture is a recognised complication of rheumatoid arthritis and after distal radius fractures and plating of the radius. We report rupture following bone harvesting from Lister's tubercle.

Background: A thirty-five year old male sustained a comminuted intra-articular fracture of the base of the middle phalanx of the left ring finger. A Suzuki frame and lag screw was applied, but was not recognised as unstable until a routine X-ray ten days later. A second procedure was performed seven days later, when a cancellous bone graft was harvested from Lister's tubercle to fill a 4mm bone gap and stabilised with a T-plate .

Post-operative recovery was uncomplicated but five weeks later the patient sustained a closed rupture of the EPL tendon. An elective extensor indices proprius (EIP) to EPL transfer was performed, and the patient made a full recovery.

Discussion: This was an attrition rupture of the EPL tendon on the edge of the cortex at the harvest site. The senior author now harvests bone grafts from the space between 1st and 2nd extensor compartments on the radius.

23 Time For Change in Cork - By Changing the Surgical and Therapeutic Interventions in the Management of Flexor Tendon Injuries Zone 2, have We made a Positive Difference in Our Patients' Recovery? Our Early Results Say YES.

Miss A O'Driscoll, Miss M Gallagher, Miss A Cronin, Mr M Davies, Miss A Ryan (Cork City)

The goal of tendon repair and rehabilitation is to provide a normally gliding and functioning tendon. In the Plastic Service of Cork University Hospital an audit was carried out over a twelve-month period, specific to Zone 2 flexor tendon injuries. The results of which saw a change in the surgical and therapeutic management, in an effort to attain this elusive goal and optimise the functional recovery for our patients. Commencing in April 2008, surgical repair of these tendons changed to a 4-strand from a 2-strand. In concert with this more robust repair, the hand therapists instituted a new therapy programme. Previous to April 2008, the therapeutic intervention followed those laid down by Small et al -1989.

A six-monthly audit was conducted, using the Strickland-Glogovac outcome measure and results compared to previous audits. Whilst early days, the "New Cork Regime" has shown favourable results in terms of goniometry and rupture rate. The emphasis of which is initiating therapy between days 3-5 and resisting the temptation to overload the repair but focusing on motion within the ever changing safe zone that the healing tendons present.

POSTERS**24 Survey of the Initial Management and Imaging Protocols for Occult Scaphoid Fractures in UK Hospitals**

Dr S Brookes-Fazakerley, Mr A Kumar, Mr J Oakley (Chester)

Aims The aim of this survey was to determine the initial management and imaging modalities, used for suspected fractures of the scaphoid in hospitals throughout the UK, in particular whether there were agreed imaging protocols in each hospital trust.

Materials and Methods: A total of eight hundred and thirty-two questionnaires were sent via e-mail to active associate members of the British Orthopaedic Association. Included was a series of questions regarding the timing of initial and subsequent orthopaedic review of this group of patients and the use of serial radiographs and second line imaging techniques.

Results: Nearly half of the UK's acute NHS trusts were represented (forty-five percent) The response rate was 16% (130/832). Only 16% of respondents were aware of a local imaging protocol for the investigation of suspected fractures of the scaphoid. 94% respondents performed a second radiograph at first fracture clinic review. 58% used MRI as a second line investigation, with CT scan and radionuclide isotope bone scan being performed by 26% and 16% respondents respectively.

Conclusions: The survey revealed a wide variation in the management of occult fractures of the scaphoid. MRI has been shown to be both sensitive and specific in diagnosing occult carpal bone fractures. There is a need to standardise the management of these injuries to ensure early diagnosis and limit unnecessary wrist immobilisation.

25 Interobserver Reliability of the Thirty Degree Lateral View in Assessing Screw Position following Volar Plating of the Distal Radius

Dr J Choueka, Dr M Semenovski, Dr P Lahey, Dr A Patel (Brooklyn)

Objectives: The purpose of this study was to evaluate the impact of the thirty degree lateral view in properly judging screw placement, following volar plating, and to determine whether a difference in its efficacy existed between orthopaedic surgeons, hand surgeons, radiologists and residents.

Materials and Methods: Sixty-five physicians participated in a two part survey of 34 post-operative volar plating cases. Each case was presented twice in random order, once with standard AP and lateral views and a second time with the addition of a thirty degree lateral view. Participants were asked to determine joint penetration by distal screws and to rate the confidence of their answer. The ability of participants to correctly determine screw position and changes in confidence levels was calculated, using paired t-tests and ANOVA for between-groups comparisons.

Results: For all participants, the addition of the thirty degree lateral view increased ability to rule out screw penetration of the joint from 58.8% to 77.5% ($p < 0.0005$) with no significance between the groups. Summed confidence scores were significantly higher with the three views compared to two views (134.29 vs. 115.60, $p < 0.001$).

Conclusion: Ability to confirm correct placement of the distal screws after volar plating is significantly improved by the addition of the thirty degree lateral radiograph with the major difference occurring in images with the most complicated angulations of distal screws relative to the subchondral surface of the distal radius.

26 Spanning Internal Fixation for Comminuted Intra-Articular Fractures of the Distal Radius Treated at a Level I Trauma Center

Dr L Katolik, Dr E Moon, Dr D Hanel (King of Prussia)

Introduction: Distal radius fractures with extensive metaphyseal-diaphyseal comminution and extensive comminution of the articular surface present a major treatment dilemma. This challenge is heightened in the patient with multiple orthopaedic and/or system injuries. Following restoration of joint congruity, application of a spanning internal fixator maintains distraction across the radiocarpal joint and allows for early use of the operative limb.

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Methods: One hundred twenty-four wrists (120 patients) treated at a tertiary trauma center were included. Eighty-five had associated systemic or lower extremity injuries. Following fracture reduction, a spanning internal fixator was placed across the radiocarpal joint dorsally and secured to the radial diaphysis proximally and the index metacarpal distally. Supplemental fixation was utilised in sixty-five wrists. Fixation was removed following fracture consolidation (mean 129 days).

Results: Mean follow-up was three hundred and ten days. Range of motion at follow-up was 40° flexion, 38° extension, 71° pronation, 69° supination. Radiographs showed an average loss of radial length of 0.8mm, tilt of 4.1 degrees, and inclination of 21.7 degrees. Forty-four patients had no articular gap or depression at follow-up. Twenty-seven had incongruity of 1-2 mm. Eight had an incongruity of >2mm. Complications included one radioulnar synostosis, six implant failures, three patients with dystrophic pain, two nonunions, two wound dehiscences, two deep infections, two superficial infections, and two tendon ruptures.

Conclusion: Spanning internal fixation is an effective treatment for comminuted fractures of the distal radius. Complications are minimal and a functional range of motion with minimal disability is achieved.

27

Distal Radius Fracture Fixation Complicated by Locking Plate Breakage and Post-Revision Infection: A Fabula Horribilis

Mr S Khan, Mr P Smitham, Mr C Gozzard (Plymouth)

We report a case of a twenty-four year-old manual worker with behavioral problems, who sustained an open fracture of his right distal radius. This extra-articular, dorsally angulated fracture was stabilised with a 3.5mm Locking Compression Plate (locking mode), followed two days later by skin graft, without the wrist being immobilised in a cast.

The patient presented to fracture clinic eight weeks later with persistent wrist pain and a radiographically evident break across the plate, at the level of the distal Combi-hole. This was managed with revision fixation using a 2.4mm LCP Distal Radius Plate in compression mode.

He developed an infected wound dehiscence two weeks later, requiring repeated washouts, debridement, VAC dressings, and antibiotics. The wound healed after revision skin grafting and the fracture achieved delayed union after another eight weeks of cast immobilisation.

The failure of the original osteosynthesis seems multi-factorial. The plate was applied across a non-osteoporotic, dorsally multi-fragmented fracture, and without bone graft. The skin graft precluded immediate casting. The patient did not adhere to non weight-bearing instructions. Poor personal hygiene contributed to infection in the later revision.

Locking plates are being increasingly used for these fractures, on the premise that they obviate the need for prolonged immobilisation, allowing early return to activity. However we feel that fixation of these seemingly simple fractures should be informed by the fracture typology as well as patient factors. Also aggressive, targeted management of the infected revision allowed the new plate to be retained, and hence facilitated fracture healing, albeit delayed.

28

Use of Mitek Bone Anchor to Stabilise the Distal Ulna in a Darrach Procedure

Mr A Lahiri, Mr N Patel, Mr M Sood (Chemsford)

Introduction: Darrach's procedure involves excision of the distal end of the ulna. The common indication is pain from degenerative changes in the distal radio-ulnar joint. Following resection of the ulnar head, one of the most common complications is instability of the distal ulnar stump. A number of techniques have been described to stabilise the distal ulna, using distally or proximally based strips of extensor carpi ulnaris and/or flexor carpi ulnaris or fascia lata. However these repairs may weaken with time and instability of the ulnar stump with recurrent or persistent wrist pain remains a frequent problem.

Technique: After resection of the distal ulna and completion of any other procedures planned, such as synovectomy or extensor tendon reconstruction, a mini-Mitek bone anchor is attached to the dorsoradial

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aspect of the distal radius. The attached Ethibond sutures are passed through the periosteum of the distal ulna. This provides for a very secure and lasting fixation.

Discussion: Secure stabilisation of the distal ulnar stump is the most important step after a Darrach's procedure and can prevent the most common complications of distal ulnar stability and persistent/recurrent pain. We propose a technique for stabilising the distal ulna that is easy, quick and dependable.

29

Should the Mid-Carpal Joint be Visualised in the Presence of TFCC Tear?

Mr N Riley, Mr C Sivaji, Mr G Packer (London)

Aim: Wrist arthroscopy is considered the gold standard for the diagnosis of the cause of wrist pain. The aim of this retrospective study is to determine whether an association exists between TFCC tears and carpal instabilities.

Methods: Two hundred and sixty wrist arthroscopies were performed between February 2005 and June 2008. The DVD recordings were reviewed by two of the authors in order to reduce inter-observer variability. The authors regularly perform routine wrist arthroscopies. All patients underwent wrist arthroscopy, using the 1.2 mm flexible Innervue™ (Biomet UK Ltd, Waterton Industrial Estate, Bridgend, South Wales, CF31 3XA) arthroscope, which allows real-time recording of the procedure. To our knowledge, this is the largest reported series using this scope. When performing wrist arthroscopy, all of our patients have both radiocarpal and midcarpal joints assessed.

Results: The age range of the patients was thirteen to eighty-five. Of the two hundred and sixty patients, 251 had positive findings. More than 60% of the patients who had TFCC pathology had either scapholunate or lunotriquetral ligament instability of varying degrees. Triquetrohamate arthritis was noted in ten patients with ulnar-sided wrist pain

Conclusion: We have demonstrated that if TFCC pathology is noted, then it is important to visualise the mid-carpal joint and address any coexisting pathology, rather than merely address the TFCC abnormality alone.

30

A New Mechanism of Injury for Scaphoid Fractures: 'Test Your Strength' Punch-Bag Machines

Dr P Sutton, Mr O Clifford, Professor T Davis (Nottingham)

Introduction and Aims: We have observed an increasing number of scaphoid fractures, which are attributable to the use of "test-your-strength" punch machines, commonly found in amusement parks and public houses. This study investigates the frequency of this mechanism of injury.

Patients and Methods: All patients who presented with a definite scaphoid fracture to the hand fracture clinic at our hospital between August 2006 and March 2008 were identified, and a retrospective review of the case notes was undertaken to establish the mechanism of injury.

Results and Statistics: One hundred and fifty-three patients were identified, 83% of whom were men. The median age was 28 (range 15 to 76) years. The most common mechanisms of injury were a simple trip/fall (50 cases), a fall when playing sport (41 cases) and a road traffic accident (23 cases). Ten (6%) cases occurred as a result of hitting a "test-your-strength" punch machine.

Conclusions and Clinical Reference: Scaphoid fractures caused by "test-your-strength" punch machines may be missed if the treating clinicians do not realise that axial loading of the wrist when punching can cause a scaphoid fracture. Such injuries may be dismissed as soft-tissue injuries and mobilised, instead of immobilised, resulting in non-union of the fracture. All clinicians who see patients with wrist injuries should be aware that "test-your-strength" punch machines can cause scaphoid fractures: they are responsible for 6% of such fractures seen in our unit where we see few, if any, soft-tissue injuries caused by these machines.

POSTERS**31 Incidence of Ulnar Neuropathy in Patients Presenting with Distal Radio-ulnar Joint Dysfunction**

Mr N Kalson, Mr P Malone, Miss V C Lees (Manchester)

The distal radio-ulnar joint (DRUJ) relies on the integrity of the triangular fibrocartilage complex together with surrounding ligaments to maintain its stability. Some patients with DRUJ dysfunction were noted to be reporting intermittent symptoms of paresthesia and numbness in the distribution of the ulnar nerve. A study was undertaken to investigate the incidence of ulnar neuropathy in patients presenting with ulnar sided wrist pain originating from the DRUJ and the TFCC.

An historical cohort of thirty-seven patients with ulnar sided wrist pain and a primary diagnosis of TFCC or DRUJ dysfunction were identified and their case records reviewed. Five of these patients (14%) were recorded as reporting ulnar neuropathy symptoms. We identified a further cohort of patients prospectively at wrist clinics. Of thirteen patients presenting with ulnar-sided wrist pain within the five-month study period, five (38%) described symptoms of intermittent numbness and tingling in the distribution of the ulnar nerve.

We hypothesise that ulnar neuropathy in these patients is due to instability of the ulnar head on the sigmoid notch with impingement of the ulna head on the ulnar nerve. It is proposed to further investigate this hypothesis with appropriate imaging techniques.

32 Factors Associated with Occurrence and Recurrence of Dupuytren's Contracture and Dermofasciectomy on Recurring Dupuytren's Contracture

Ms Y Y Lim, Mr J McCann (Galway)

Dupuytren's contracture has long been described but the aetiology has always been unclear. The aim of the research was to provide an opportunity to enrich the student's clinical learning exposure, enhance the ability to relate the effects Dupuytren's contracture has on the patient's daily life and to learn to critically appraise Dupuytren's literature. This study reviews one hundred and six patients' charts that underwent surgery for Dupuytren's contracture under the Department of Plastic, Reconstructive and Hand Surgery at University College Hospital Galway, Ireland from 1997 to 2006. Several commonly associated factors were noted for the occurrence of Dupuytren's contracture. Recurrence of Dupuytren's contracture was only found to have an association with a positive family history (p value=0.045) and little finger involvement (p value=0.014).

Dermofasciectomy was carried out on younger patients and the majority were on recurrent Dupuytren's contracture. No definite individual aetiology has been clearly associated with Dupuytren's contracture although multiple factors may contribute to its development. Currently dermofasciectomy seems to provide one of the lowest rates of recurrence with improved hand function and acceptable cosmesis, especially among patients with higher risk of recurrence however, fasciectomy is still the main treatment of choice for most Dupuytren's contractures.

33 A Retrospective Outcome Study of Surgery in the Rheumatoid Hand

Miss S S Jing (London)

Objective: To carry out a retrospective study of the surgical outcomes in patients with rheumatoid hand disease in terms of functional disability, aesthetics, pain and quality of life.

Methods: Fifteen patients were assessed, on an average of 9.5 months post-operatively, for grip strength, pinch strength, range of movements in the metacarpophalangeal joints, by nine-hole peg test, and digital photography of the operated hand. Subjective assessment by aesthetic numerical analogue scale, Quick Disability of the Arm, Shoulder and Hand questionnaire and overall surgical satisfaction were also performed. A database was created in order to create a bank of data for rheumatoid arthritis patients undergoing hand surgery to aid future research.

Results: In the functional disability assessment, the largest improvements were shown in the pinch strength (6.15kg with the dominant hand and 4.18kg with the non-dominant hand) after hand surgery by comparing to that of the normal values (6.44kg with the dominant hand, 6.12kg with the non-dominant hand) in healthy individuals. Overall, patients' satisfaction with surgery was high (98.7%). However, that of the aesthetics and the surgical impact on life was quite modest (36.5% and 35.3% respectively).

Conclusion: Our data shows that there is a clear benefit of surgery in rheumatoid hand disease. Further objective data into the specific types of hand surgery is required from future research. Adequate counselling is required early on in the course of disease, so that benefits of surgery can be truly realised.

MEETING INFORMATION**REGISTRATION FEES**

IMPORTANT NOTICE: Doctors or scientists engaged in research AND presenting a paper will not be charged a registration fee if they can confirm in writing that they have no access to study leave expenses. They must however pay £70.00 to cover the cost of refreshments and luncheon each day they attend the meeting. This is applicable to BSSH and ASSH members.

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

The registration fees include refreshments and luncheon during the scientific meeting.

		Registration Fee
Full / Overseas / Associate Member and Other of both BSSH and ASSH	Scientific Meeting	£600
	Per day Thursday & Friday	£260
	Saturday	£140
Trainees (UK & USA*)/ Companion Members (BSSH) <small>*For US Trainees, please provide a letter from your programme director certifying your training status</small>	Scientific Meeting	£350
	Per day Thursday & Friday	£145
	Saturday	£75
Honorary, Senior Members Speakers who are research doctors or scientists	Per day Thursday & Friday	£70
	Saturday	£40

REGISTRATION AND ENQUIRY DESK

The Registration and Enquiry Desk, (situated in the main entrance hall) will be open at the following times:-

Thursday	7.30 am - 4.00 pm
Friday	7.30 am - 4.00 pm
Saturday	7.30 am - 1 pm

The telephone number of the Registration and Enquiry Desk during the Meeting is: 020 7390 1560.

VENUE OF SCIENTIFIC MEETING

The Scientific Meeting will take place in the Assembly Hall.

CONTRIBUTORS INFORMATION**Projection Facilities**

Projection of presentations will be by PowerPoint only. The AV will be provided in-house.

Contact: ben@churchhouseconf.co.uk. Telephone: 0207 390 1574.

Presenters are asked to e-mail their presentation to this e-mail address at least two days before the event.

Guarantee cannot be given that presentations sent the day before an event or brought on the day can be tested.

SPEAKERS ARE ASKED TO KEEP STRICTLY TO THE TIME ALLOCATED FOR THEIR PRESENTATION.

CAR PARKING

Car Parking in London is extremely expensive and we would strongly recommend the use of public transport.

MEDICAL AND TECHNICAL EXHIBITION

Firms supplying instruments, appliances, materials and books will be exhibiting throughout the meeting in the Hoare Memorial Hall, Bishop Partridge Hall and Harvey Goodwin Suite, where refreshments and luncheon will be taken. It is hoped that everyone will support this exhibition.

POSTER PRESENTATIONS AND POSTER PRIZE

Posters will be displayed in the Assembly Hall and authors of posters will be expected to 'man' their posters during the second half of lunchtime on Friday in order to provide opportunity for discussion between delegates and authors. A prize of £250 will be awarded to the best poster.

HOTELS

All prices quoted include breakfast, service and VAT at the prevailing rate.

All unsold rooms have been released on 1 April and the prices listed below cannot be guaranteed.

		Cost per night	
		single	double
Westminster Thistle Buckingham Palace Road London SW1W 0QT www.thistle.co.uk	To book by telephone: Reservations - +44(0)207 834 1821 Not available to book online - guests can send an email to reservations.westminster@thistle.co.uk Group code to quote on booking: BRIT290409 Walking distance from Church House: - approx 4 minutes 50 rooms available	£185.00	£199.95
Hesperia London Victoria 2 Bridge Place, Victoria, London SW1 V 1QA www.hesperia.com/ hotels/hesperia-london- victoria	To book by telephone: Reservations - +44(0)207 834 8123 option 1 Not available to book online - guests can send an email to hotel@hesperia-londonvictoria.com Group code to quote on booking: BSSH/3311498 Walking distance from Church House: - approx 15 minutes 50 rooms available	£180.00	£195.00
Grosvenor Thistle Hotel Buckingham Palace Road London SW1W 0SJ www.thistle.co.uk	To book by telephone: Reservations - +44(0)207 868 6248 Not available to book online - guests can send an email to reservations.grosvenor@thistle.co.uk Group code to quote on booking: BRIT290409 Walking distance from Church House: - approx 7 minutes 75 rooms available	£175.00	£185.00
Days Hotel London Waterloo 54 Kennington Road London SE1 7BJ www.the.daysinn.com/ london12578	To book by telephone: Reservations - +44(0)207 922 1331 Not available to book online - guests can send an email to hotel@hotelwaterloo.com Group code to quote on booking: BSSH - 57995 Walking distance from Church House: - approx 20 minutes 50 rooms available	£99.00	£105.95

DIRECTIONS AND MAP

The website addresses have been included for all venues and directions for each venue are included within the websites.

BSSH FUTURE MEETINGS – 2009

12/13 November Crowne Plaza Hotel, Nottingham.

MEETING INFORMATION**CONTINUING MEDICAL EDUCATION**

CME points for the Spring Meeting are as follows:

Thursday:	5.5 points
Friday:	6.0 points
Saturday:	3.5 points
Total:	15.0 points

CME CREDIT HOURS

The American Society for Surgery of the Hand designates this educational activity for a maximum of 15.50 *AMA PRA Category 1 Credits™*. Physicians should only claim credit commensurate with the extent of their participation in the activity.

ACCREDITATION

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the American Society for Surgery of the Hand and The British Society for Surgery of the Hand. The ASSH is accredited by the ACCME to provide continuing medical education for physicians.

SOCIAL EVENTS

Tickets for all social events should have been booked in advance. However, a limited number of tickets for some of the events may still be available. Please enquire at the Registration Desk.

Day/Date	Cost per Person	Social Event	Tour Programme	Time
Wednesday 29 April	£20.00	Reception at Christies		18:00 - 20:30
Thursday 30 April	£75.00	Society Dinner		19:15 for 20:00
Thursday	£20.00		National Gallery (Highlights Tour)	15:30 - 17:30
and Friday 30 April:	£20.00		National Portrait Gallery	15:30 - 17:30
and 1 May	£20.00		Walking Tour of Whitehall, including Banqueting House	15:30 - 17:30
	£20.00		Walking Tour of Palaces	15:30 - 17:30
Saturday 2 May	£35.00		Westminster Abbey & The London Eye	12:45 - 17:00
Sunday 3 May	£25.00		Greenwich by Boat	11:00 - tbc

Reception at Christie's

Sponsored by Osteotec Ltd

<http://www.christies.com>

8 King Street, St James, London SW1

Time: 6.00pm - 8.30pm

Founded in 1766 by James Christie, Christie's conducted the greatest auctions of the 18th, 19th and 20th centuries, and today remains a popular showcase for the unique and the beautiful. Christie's holds auctions in many categories, including all areas of fine and decorative arts, jewellery, photographs, collectibles, wine, cars and more.

It is proposed to hold a mock auction. Peter Weiss has very kindly donated some items to donate consisting of several 18th and 19th century drawings of hands.

Thursday and Friday Afternoon Functions

All excursions will depart from Church House Conference Centre at 3.30pm and last approximately 2 hours.

Options available are listed below and all to be accompanied by a blue badge guide in groups of 25 persons:-

- a) **National Gallery (highlights tour)** - www.nationalgallery.org.uk
- b) **National Portrait Gallery** - www.npg.org.uk
- c) **Walking Tour of Whitehall, including Banqueting House**
(if open to the public on this date) - <http://www.hrp.org.uk/BanquetingHouse/> Walk from Parliament Square to Trafalgar Square and see the Cabinet Office, Downing Street, Horse Guards, the Cenotaph, Scotland Yard and the Banqueting House, the only surviving portion of the palace of Whitehall, outside which King Charles I was executed.
- d) **Walking Tour of Palaces, including:**
St James Park, Buckingham Palace, Lancaster House, Clarence House, St James Place, St James Palace and Carlton House.

Tickets are priced at £20.00 each.

Refreshments should be paid by individuals.

Society Dinner

Drinks Reception sponsored by SAGE Publications

Thursday, 30 April at 19:15 for 20:00.

The Great Hall, The Honourable Society of Lincoln's Inn, London, WC2A 3TL

www.lincolnsinn.org.uk

Lincoln's Inn is one of the four Inns of Court. The Inns of Court are ancient unincorporated bodies of lawyers which for five centuries and more have had the power to call to the Bar those of their members who have duly qualified for the rank or degree of Barrister-at-Law. With the power of call goes a power to disbar or otherwise punish for misconduct, a power which has had to be exercised only infrequently.

The Great Hall at Lincoln's Inn is one of the most distinguished buildings designed by Philip Hardwick (1792-1872). Working in the Tudor Revival Style, he produced a building of great originality, strength and refinement, considered by Pevsner to be the best surviving example of its kind in London.

The foundation stone was laid in 1843 and the opening ceremony was attended by Queen Victoria in 1845. On the North wall is a huge and magnificent fresco executed by G F Watts, the Pre-Raphaelite painter, showing the world's law-givers from Moses to Edward I.

The Society Dinner is open to delegates all of whom may invite guests. Lounge suits should be worn.

MEETING INFORMATION**Westminster Abbey
& The London Eye Excursion****Westminster Abbey**

www.westminster-abbey.org

Saturday, 2 May at 12:45, meet outside Westminster Abbey. Sandwiches will be provided at Church House at 12:15.

This excursion is made up of a two hour guided in depth tour.

Westminster Abbey is steeped in more than a thousand years of history. Benedictine monks first came to this site in the middle of the tenth century, establishing a tradition of daily worship which continues to this day. The Abbey has been the coronation church since 1066 and is the final resting place of seventeen monarchs.

The present church, begun by Henry III in 1245, is one of the most important Gothic buildings in the country, with the medieval shrine of an Anglo-Saxon saint still at its heart.

A treasure house of paintings, stained glass, pavements, textiles and other artefacts, Westminster Abbey is also the place where some of the most significant people in the nation's history are buried or commemorated. Taken as a whole the tombs and memorials comprise the most significant single collection of monumental sculpture anywhere in the United Kingdom.

The London Eye

www.londoneye.com

Saturday, 2 May after Westminster Abbey tour.

The cost of this excursion is £35.00. Refreshments should be paid by individuals.

Greenwich by Boat

www.westminsterpier.co.uk

This will be an all day excursion to Greenwich by boat, leaving Westminster Pier at about 11:00.

The tour will include visits to the following:-

Observatory

www.nmm.ac.uk/places/royal-observatory/

Maritime Museum

www.nmm.ac.uk

Queens House

www.nmm.ac.uk/about/history/queens-house

Old Royal Naval College

www.oldroyalnavalcollege.org

Time at Greenwich Market

www.greenwichmarket.net

There will be a guided tour of the Observatory and / or Naval Museum with some time allowed visiting Greenwich Market.

The cost of this excursion is £25.00. Refreshments should be paid by individuals.

TRADE EXHIBITORS

BP = Bishop Partridge Hall (Gold Sponsors' Room) – First Floor

HH = Hoare Memorial Hall – First Floor

HG = Harvey Goodwin Suite – Ground Floor

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STAND BP 1

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Contact: Mr R Craddock

Since 1988, Acumed has been designing solutions to the demanding situations facing orthopaedic surgeons, hospitals and their patients. Our strategy has been to know the indication, design a solution to fit, and deliver quality products and instrumentation. We look forward to discussing and demonstrating our very latest products for hand surgery and wish the members of both the BSSH and ASSH a very successful meeting.

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Contact: Mrs B Warmington

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STAND HG 2

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Telephone: 07795 117 877, Fax: 01451 812 235, E-mail: jkelly@bmrn.com

Contact: Ms J Kelly

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Contact: Mrs M Wilding

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42 Lower Place, London NW1 2BE

Telephone: 020 7611 2160, Fax: 020 7611 2163, E-mail: exhibitions@blackwell.co.uk

Contact: Mr R Demery-Kane



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STAND BP 5

Capitol Park, Capitol Boulevard, Leeds LS27 0TS

Telephone: 07810 566 008, E-mail: ccanaves@its.jnj.com

Contact: Miss C Canavesio

DePuy, a Johnson & Johnson company, are synonymous with quality Orthopaedic products for a variety of indications. This year, we are delighted to launch the A.L.P.S. Hand Fracture System. Representing the next generation in anatomic plate design, it combines the benefits of low profile titanium plate metallurgy with the advantages of multiplanar locked screw technology.

The low profile plates help minimise discomfort and soft-tissue irritation, and are contoured to mimic the anatomy of the fingers. With five sizes, they can be used in metacarpal and phalangeal procedures that often involve complex fractures and minimal tissue coverage. Offering a combination of strength and in-situ flexibility, these plates may be used to treat even the most challenging cases.

Building on the successful design of the Hand Innovations DVR® distal volar radial plates, the F.A.S.T. Guide™ instrumentation is accurate and reproducible. These features allow the formation of a three dimensional matrix of fixed and variable angle screws to create a true subchondral scaffold that can provide fixation in comminuted fractures or osteoporotic bone.

We are delighted to be supporting the combined BSSH/ASSH meeting, and look forward to meeting you over the duration of the conference.

Please visit the DePuy stand for more information.

HEALING FOUNDATION

STAND HH 3

Royal College of Surgeons, 35-43 Lincoln's Inn Fields, London WC2A 3PE

Telephone: 020 7869 6923, Fax: 020 7869 6929, E-mail: brendane@thehealingfoundation.org

Contact: Mr B Eley

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 Contact: Ms L Howard

STAND HH 5**MEDARTIS LTD (GOLD SPONSOR)**

MEDARTIS® Suite 63, Annexe 4, Batley Business Park, Technology Drive,
 Batley, West Yorkshire WF17 6ER
 Telephone: 01924 476 699, Fax: 01924 472 000, E-mail: anna.walsh@medartis.com
 Contact: Mrs A Walsh

STAND BP 4

The philosophy and work of MEDARTIS® have been forged through the pioneering achievements of The Straumann Group in metallurgy, osteosynthesis, and implantology.

In 1954 Professor Reinhard Straumann founded The Institut Straumann AG, which specialised in metallurgy and physics in the clock- and watchmaking industry. As a result of close cooperation with the AO Foundation (Association for the Study of Internal Fixation) his son Dr. Fritz Straumann employed the company's expertise in metallurgy, physics and medicine to develop and produce metal implants for the surgical management of fractures.

At the end of 1989 the company sold the Osteosynthesis Division in the framework of a management buyout, and under the leadership of Dr. Thomas Straumann the company concentrated exclusively on oral implantology. Nowadays the Straumann Group is considered one of the world leaders in this field.

In 1997 Dr. Thomas Straumann formed the MEDARTIS® Group thereby going back to osteosynthesis in cranio-maxillofacial surgery. MEDARTIS® continued the development in metallurgy and disposes today of extensive know-how in the production of high quality titanium implants.

In 2004 The MEDARTIS® Group expanded its product portfolio entering the orthopaedics and hand surgery market. The following year the company launched its own production factory in Bretzwil, Switzerland.

MMI INC USA

6000 Poplar Avenue, Suite 110, Memphis, TN 38119, USA
 Telephone: 00 1 901 685 7557, Fax: 00 1 901 685 3488, E-mail: dkeith@mmi-usa.com
 Contact: Ms D Keith

STAND HG 5**NORTHSTAR ORTHOPAEDICS LIMITED**

NorthStar House, 26 Kingfisher Court, Hambridge Road, Newbury, Berkshire RG14 5SJ
 Telephone: 01635 275 380, Fax: 01635 275 381, E-mail: Richard@northstar-ortho.co.uk
 Contact: Mr R Forster

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 Contact: Mr G Thomas

STAND BP 2 & 3

As a specialist supplier of upper limb and foot implants, OsteoTec Ltd. works closely with leading suppliers from around the world to bring a wide range of high quality products to the UK Hand Surgeon.

Together with Ascension Orthopaedics, we now supply a growing range of Pyrocarbon, silicone and metal upper limb implants. Dr. C. Hamblin from Denver, will be available on our booth during breaks, to discuss his clinical experience with the Pyrodisk implant

continued overleaf...

TRADE EXHIBITORS

...OsteoTec Ltd continued

for the CMC. Ascension implants for the PIP, MCP, CMC, DRUJ & radial head will also be displayed. Dr. John Faillace from Texas will also be available on the OsteoTec booth during breaks, to discuss the 'Trimed' distal Radial Fixation system.

OsteoTec also supply products from Integra ('Spider', Universal 2 Wrist & Kompessor screw), OsteoMed (small cannulated screws & power tools) and Arex (Ligamentotaxor & Universal Tendon Rod).

The Mediracer Carpal Tunnel Device is becoming the standard for carpal tunnel testing, facilitating the 18 week pathway to be achieved.

OsteoTec is also introducing a range of it's own products, from the Osteotec Silicone Finger Implant, the Ulna Cutting Guides and introducing the Concentric Bone Graft System and 'Skeligraft' synthetic bone substitute.

Please visit the OsteoTec booth in Bishop Partridge Hall, First Floor.

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Contact: Miss M Adams

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Hambridge Road, Newbury, Berkshire RG14 5EG

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Contact: Ms J Preston

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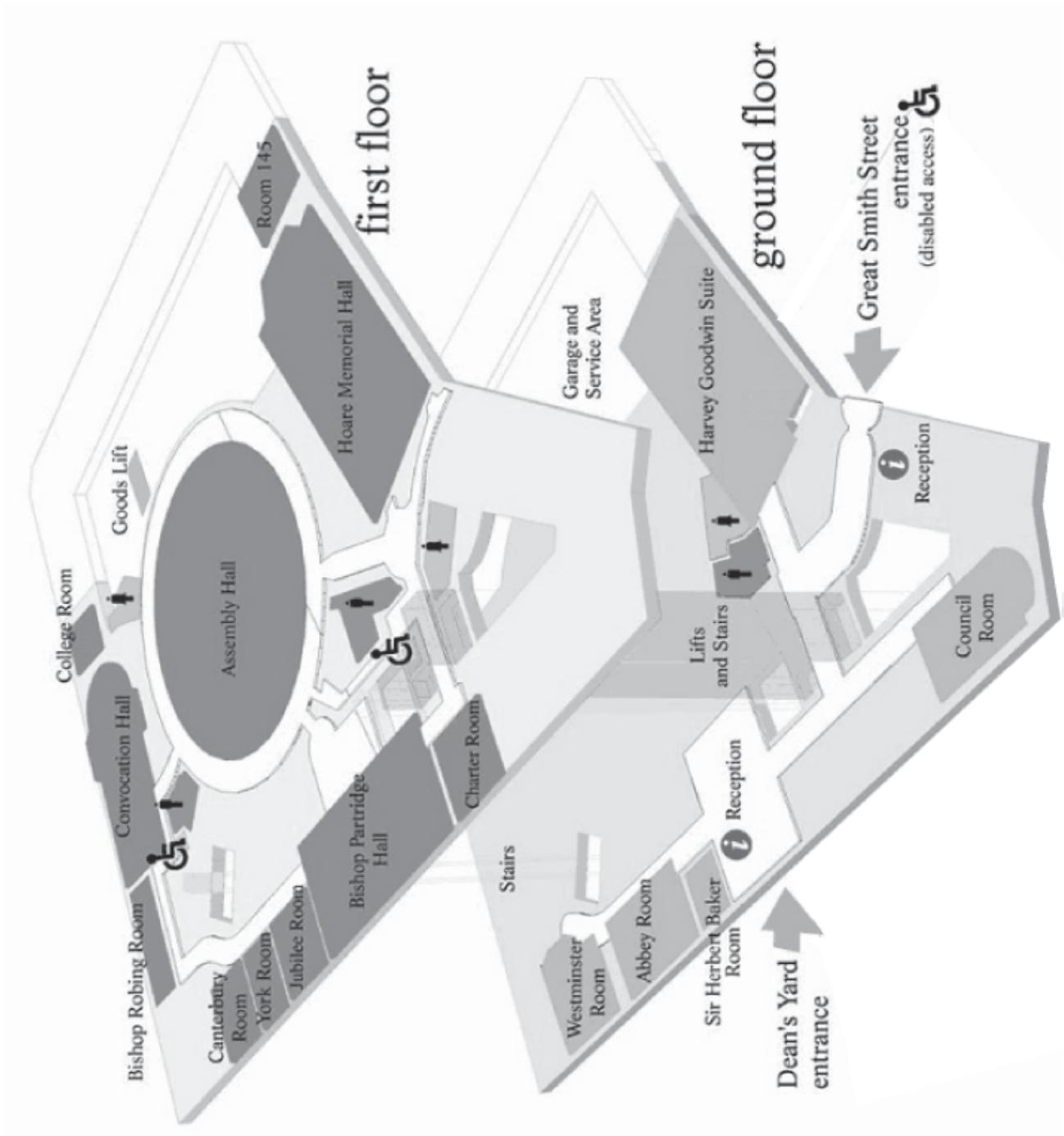
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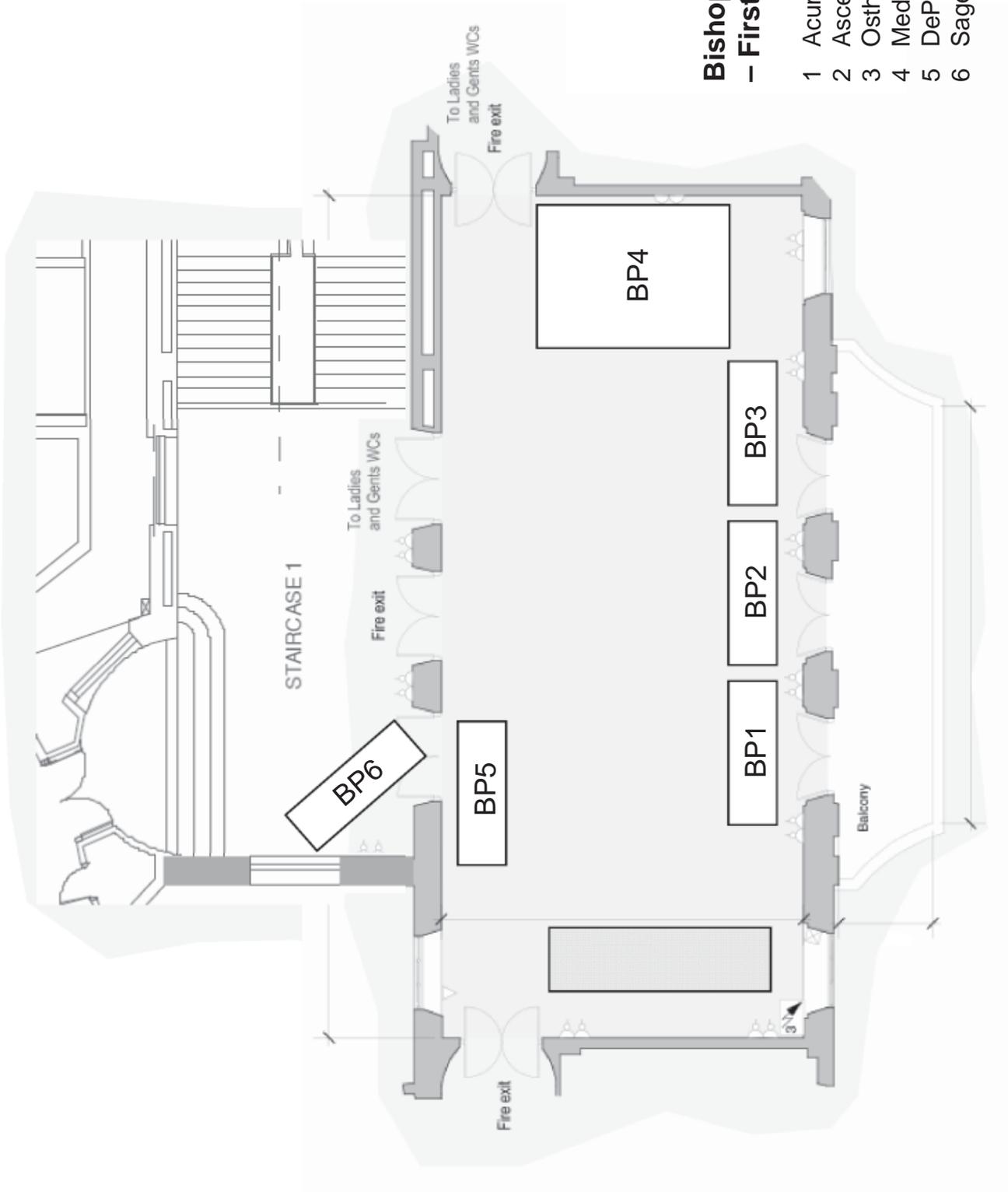
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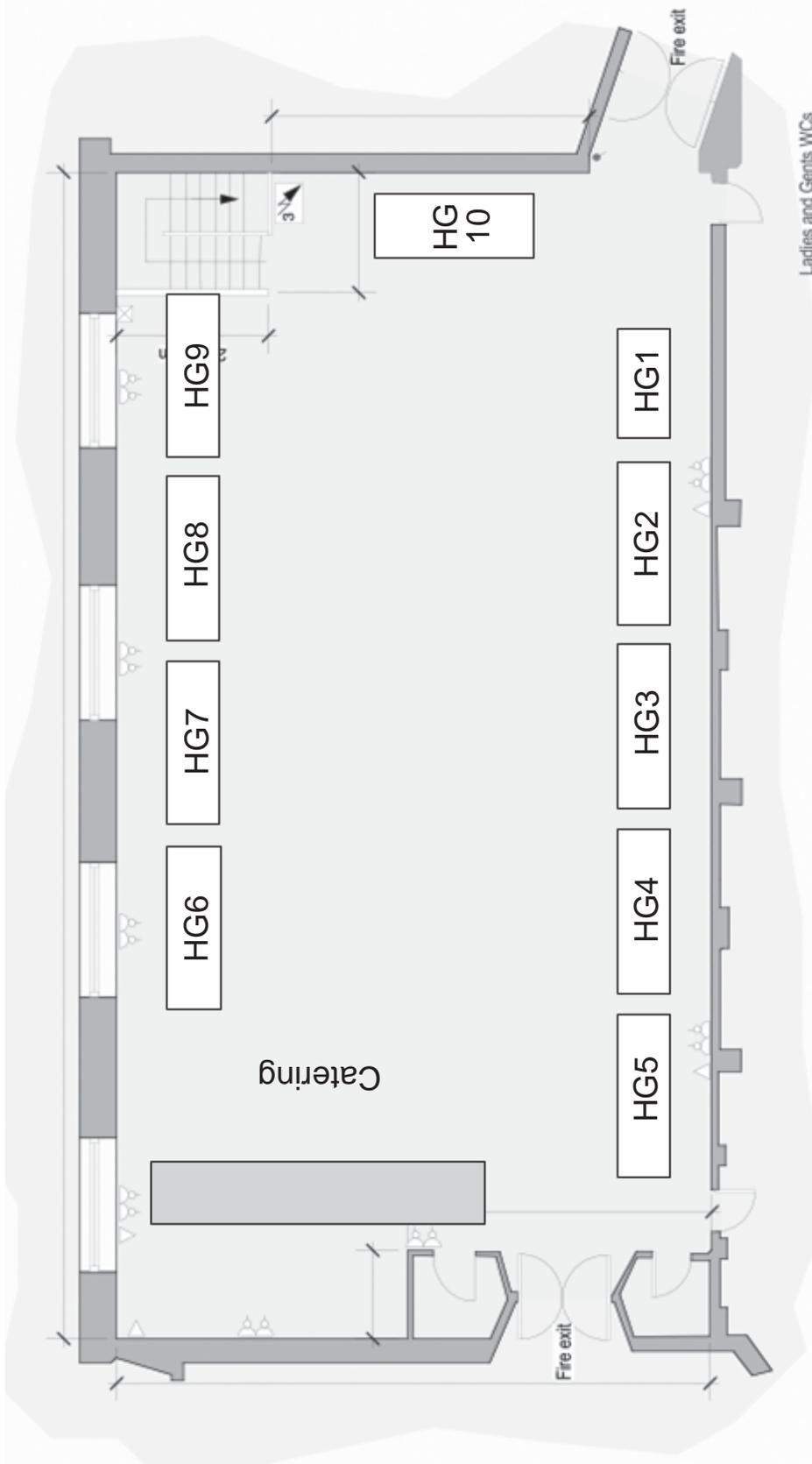
Church House



**Bishop Partridge Hall
– First Floor**

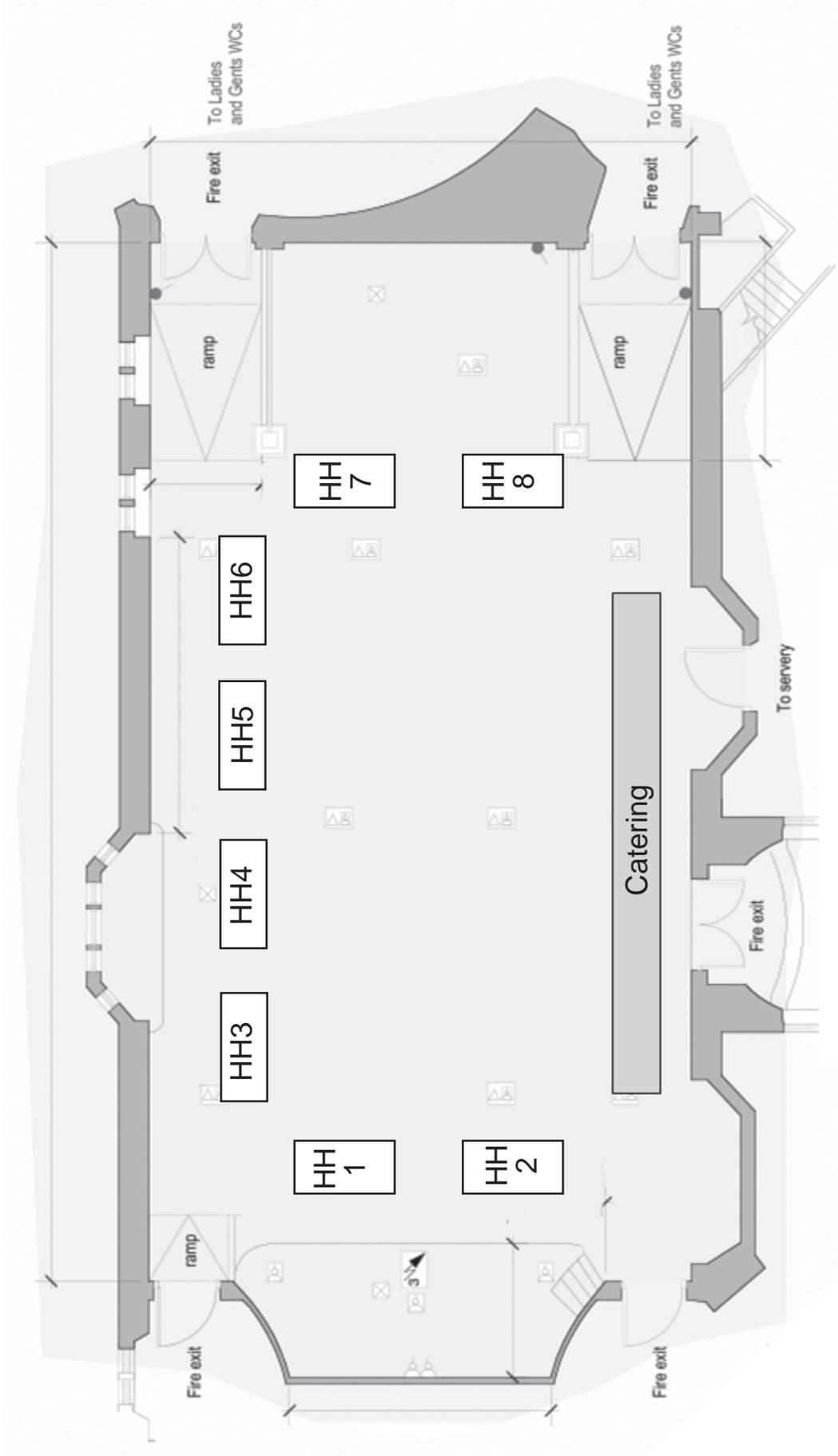
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MEDICAL AND TECHNICAL EXHIBITION



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