

BSSH

The British Society for
Surgery of the Hand

SCIENTIFIC MEETING

1st - 2nd May 2008

LEICESTER CITY FOOTBALL CLUB
LEICESTER

PROGRAMME



BRITISH SOCIETY FOR SURGERY OF THE HAND

**at The Royal College of Surgeons
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BRITISH SOCIETY FOR SURGERY OF THE HAND

OUTLINE PROGRAMME

SPRING MEETING : 1-2 MAY 2008

Thursday, 1 May

| | |
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| 09.00 | Refreshments and Registration |
| 09.30 | Welcome by the President |
| 09.35 | Free Papers: Dupuytren's Contracture |
| 11.05 | Refreshments and trade exhibitions |
| 11.30 | Common Congenital Hand Disorders: Best Management and Outcome |
| 12.15 | Douglas Lamb Lecture delivered by Professor S E R Hovius: 'Operating on the Hand: What I used to do and still do' |
| 13.00 | Luncheon and trade exhibitions |
| 14.00 | Free Papers: Trauma |
| 15.30 | Refreshments and trade exhibitions |
| 16.00 | Free Papers: Rheumatoid Arthritis |
| 17.05 | Business Meeting to discuss membership applications (open to full members and associates only) |
| 19:30 for | |
| 20:00 | Society Dinner – The City Rooms, Leicester |

Friday, 2 May

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| 08.30 | Registration |
| 08.59 | Welcome by the President |
| 09.00 | BSSH Research Agenda |
| 09.30 | Free Papers: Wrist |
| 10.35 | Refreshments and trade exhibitions |
| 11.05 | Continued Professional Development: What can the BSSH do for you |
| 11.25 | Archiving Videos of Hand Conditions |
| 11.35 | Guest Lecture delivered by Mr M Crumplin: Trauma Surgery in the Napoleonic Wars |
| 12.20 | Luncheon and trade exhibitions |
| 13.15 | The Geoffrey Fisk Symposium of the Zigzag Wrist |
| 14.15 | Free Papers: Nerve and Miscellaneous |
| 15.45 | Conclusion by the President |
| 15.50 | Close of meeting and Refreshments |

THURSDAY, 1 MAY

09:00 Refreshments and Registration

09:30 Welcome by the President

FREE PAPERS – DUPUYTREN’S CONTRACTURE CHAIRMAN: MR N D DOWNING/MR M K SOOD

09:35 **The Science of Dupuytren’s Disease: The Current State**
Professor D A McGrouther (Manchester)

09:50 **Assessment and Recording of Dupuytren’s Contracture**
Mr D Warwick, Mr A Mohan (Southampton)

10:00 **Recurrence and Complication Rates following First Revision Fasciectomy for Dupuytren’s Contracture**
Mr P Kanapathipillai, Mr R Nanda, Mr S Gupta, Professor J Stothard, Mr A Middleton (Middlesbrough)

Introduction: Recurrence rates of flexion contracture are high in Dupuytren’s disease. A significant proportion of patients will require revision surgery. We aimed to assess outcome and factors predictive of outcome in patients having their first revision fasciectomy.

Methods: All first revision fasciectomies over a five-year period (2001-5) were identified. Pre- and post-operative flexion contractures and complications were analysed on forty-three operated fingers (average follow-up 14.8 months). All patients were sent the validated BSSH postal questionnaire assessing surgical outcome and further analysis was possible on twenty-four of these operated fingers (average follow-up 47.2 months).

Results: MCPJ: The average pre-operative contracture of 44° was corrected by 91% to 5° at 14.8 months. Half of MCPJs that were fully corrected at the time of surgery remained corrected at three years.

PIPJ: The average pre-operative contracture of 63° was corrected by 68% to 20° at 14.8 months. 62% of fully corrected PIPJs had some level of recurrence at three years (20% being worse than the original pre-operative contracture). Operating on PIPJs with pre-operative flexion contractures of greater than 60° significantly increased the risk of recurrence.

We did not find that full thickness skin grafting at the level of PIPJ (24 out of 31) or complete on-table correction significantly reduced the rate of contracture recurrence after three years. Complications occurred in 40% of patients, the commonest being infection (20%) followed by neuropraxia (16%).

Discussion: Patients can be more accurately counselled prior to operation for first revision fasciectomy with regards to both recurrence and complication rates.

10:10 **Securing Full Thickness Grafts in the Hand: Don’t be Afraid to Quilt!**
Mr M A Akhavani, Mr T Mackinnell, Mr N Kang (London)

Introduction: A skin graft is the simplest way to reconstruct an area of skin loss. To improve the chance of successful take, shearing forces and haematoma formation between the bed and the graft must be reduced. To achieve this, many surgeons use a tie-over dressing to secure the graft. However, “quilting” the graft to the wound bed is an alternative method for securing grafts which may be superior to tie-over dressings. The purpose of this study was to compare the outcome of securing full thickness grafts by tie-over dressing versus quilting in the hand.

Materials and Method: A retrospective study was performed comparing the outcome of a tie-over dressing versus quilting to secure FTSG in a series of patients undergoing dermofasciectomy by a single surgeon. A total of forty case notes were studied, with 20 patients in each group.

Results and Statistics: Amongst the forty patients, there was only one complete and one partial graft failure – both due to haematoma in the tie-over dressing group. The grafts secured by quilting had a 100% graft take. There were no other recorded complications or adverse outcomes.

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Conclusion and Clinical Relevance: Our results demonstrate no significant difference in graft-take comparing grafts secured with a tie-over dressing or by quilting. Importantly, there were no cases of injury to the tendons or neurovascular structures in those cases where the graft was secured by quilting. Our technique for securing the graft by quilting is less time consuming compared with a tie-over dressing. Therefore, we no longer use tie-over dressings to secure full thickness grafts in the hand.

10:15 Discussion

10:22 **Visual and Computer Software-Aided Estimates of Dupuytren's Contractures, Correlation with Clinical Goniometric Measurements**

Dr R Smith, Professor J J Dias, Mr A Ullah, Mr B Bhowal (Leicester)

Aim: To assess the accuracy of visual and computer software-aided estimations of Dupuytren's contractures compared to clinical goniometric measurements.

Introduction: Correction of Dupuytren's contractures represents a significant workload. The success of surgical release of an affected finger is measured by straightness, recurrence does occur. Patients requiring post-discharge follow-up should be kept to a minimum.

Methods: Patients with Dupuytren's disease had their hands digitally photographed by a consultant hand surgeon. These digital images were visually assessed, noting their degree of contracture, by six orthopaedic staff. The same six people again assessed the images but aided with computer software. Pearson's correlations with the actual measurements were made and reliability was assessed with the intra-class correlation coefficient and test-retest analysis.

Results: Sixty patients with Dupuytren's disease had their hand photographed, 10 photographs were duplicated for test-retest analysis. This resulted in seventy-six unique Dupuytren affected finger joints: 53 little PIPJ's, 6 little DIPJ's and 17 ring PIPJ's. The average correlation across all assessors between the actual measurements and the visual estimations was 0.83 (0.81-0.86) ($p < 0.01$) and a significantly ($p < 0.05$) higher correlation of 0.88 (0.84-0.91) ($p < 0.01$) was achieved with computer software-aided estimates. Reliability with intra-class correlations achieved 0.78 (CI 0.68-0.86) for the visual estimations, 0.92 (CI 0.88-0.91) for the computer-aided estimations and with test-retest analysis, 0.92 for visual estimation and 0.95 for computer-aided measurements.

Conclusion: Visual estimations of Dupuytren's contractures correlate well with actual clinical goniometric measurements and improve further with computer software. Digital images permit monitoring of contracture after surgery without the need to attend a follow-up clinic.

10:27 **The Use of Splints following Fasciectomy for Dupuytren's Contracture**

Mr J Fischer, Dr R Rees, Mr A Morris, Mr A Simison (Wirral)

Introduction: Although splintage is routinely used in the post-operative rehabilitation following fasciectomy for Dupuytren's contracture, this is a poorly researched subject. Controversy exists regarding essential issues like the efficiency of splintage, type and length of splintage protocols, patient compliance and problems with the use of splints. We report the results of an audit reviewing patient compliance and problems with the use of splints following fasciectomy.

Methods: Questionnaires were sent to all patients who underwent fasciectomy between January and August 2006. The questionnaires were not marked to encourage patients to give an honest answer. Sixty-two questionnaires were sent out and 43 returned, two of which were incomplete.

Results: The average length of use was 3.5 months. Reasons to stop included no perceived further benefit in twenty-two patients (average length of use 3.5 months), advised by therapist (8 patients, 3.9 months), problems (3 patients, 4.3 months), other reasons (4 patients), six no answers. Problems with the splint included: "None" (24 patients, average length of use 3.2 months), "pain/discomfort" (9 patients, 3.3 months), "fitted badly" (3 patients), "other" (5 patients).

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Conclusions: Patients accepted the need for use of a splint as part of their rehabilitation. The average length of splintage was shorter than recommended with a high proportion of patients feeling no further benefit in the continued use of a splint. Although some problems with the splints were encountered, this did not have an obvious negative impact on compliance. Further research is required in this field.

10:32

Maintenance of Correction following Dupuytren's Fasciectomy: The Effect of the Abductor Digiti Minimi Cord

Mr M J Walton, Mr D Pearson, Mr R K Bhatia (Bristol)

Introduction: This study aims to establish the influence of the Abductor Digiti Minimi cord (ADM) in Dupuytren's Contracture (DC) and assess its effect on the correction achieved by fasciectomy.

Method: A prospective study of thirty-eight consecutive patients undergoing fasciectomy for little finger DC between March 2006 and March 2007. The presence of an ADM or pretendinous cord (PT) was identified at operation. Deformity was measured pre-operation, after fasciectomy and at six months.

Results: 29% (11/38) had a deformity caused by an ADM cord. All patients in the ADM group had a PIPJ flexion contracture (mean 66°, SD 26.6°). 10/11 had an isolated PIPJ contracture. Only 6/27 patients in the PT group had an isolated PIPJ contracture. 21/27 patients in the PT group had a MCPJ contracture (mean 51°, SD 16°). 10/21 PIPJ contractures in the PT group and 6/11 in the ADM group were fully corrected. One patient was lost to follow-up in each group. 6/9 fully corrected PIPJs in the PT group developed a recurrent contracture at 6/12 (mean 26°, SD 15°). 4/5 in the ADM group recurred with a mean of 16° (SD 9.5°). There was no statistically significant difference between the two groups in terms of pre-operative deformity, correction achieved or maintenance of correction.

Conclusions: DC of the little finger is caused by an ADM cord in 63% of isolated PIPJ contractures and appears to rarely affect the MCPJ. The ADM cord however does not appear to influence attainment or maintenance of correction.

10:37

Recurrence and Complication Rates Following Primary Fasciectomy for Dupuytren's Contracture

Mr P Kanapathipillai, Mr R Nanda, Mr S Gupta, Professor J Stothard, Mr A Middleton (Middlesbrough)

Introduction: A recently published BSSH audit presented average national multi-centre results. We retrospectively audited the outcome of primary fasciectomy conducted in a busy unit (>100 cases per year) in order to offer patients accurate information on their likely post-operative outcome.

Methods: All primary fasciectomies conducted over a five-year period (2001-5) were identified. Pre- and post-operative flexion contractures and complications were analysed on two hundred and twelve operated fingers in 148 patients (mean follow-up 10.9 months). All patients were sent the validated BSSH postal questionnaire assessing surgical outcome and further analysis was possible on one hundred and seven of these operated fingers (mean follow-up 40 months).

Results: MCPJ: The average pre-operative contracture of 40° was corrected by 95% to 2° at 10.9 months. 80% of MCPJs that were fully corrected at the time of surgery remained corrected at forty months. PIPJ: The mean pre-operative contracture of 60° was corrected by 70% to 18° at 10.9 months. 58% of PIPJs that were fully corrected at operation had some level of recurrence at forty months. More severe pre-operative contractures (>60° in PIPJ) and incomplete on-table correction significantly predisposed to a worse outcome. Complications occurred in sixty-three operated fingers (30%), the commonest being infection (9.9%) and neuropraxia (8.4%). None of the complications were found to be related to the severity of initial pre-operative contracture nor to adversely affect outcome.

Clinical Relevance: Patients can be more accurately counselled prior to operation for primary fasciectomy with regards to the recurrence and complication rates.

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10:42 **Tricks, Tips and Pitfalls in Dupuytren's Contracture Surgery**
Mr A M Logan (Norwich)

10:57 Discussion

11:05 Refreshments and Trade Exhibitions

COMMON CONGENITAL HAND DISORDERS: BEST MANAGEMENT AND OUTCOME
CHAIRMAN: MISS R L LESTER/PROFESSOR DR S E R HOVIUS

11:30 **Camptodactyly**
Ms G Smith

11:45 **Simple Syndactyly**
Mr H Giele (Oxford)

12:00 **Polydactyly**
Miss R Lester (Birmingham)

DOUGLAS LAMB LECTURE
CHAIRMAN: PROFESSOR J J DIAS

12:15 **Operating on the Hand: What I used to do and still do**
Professor Dr S E R Hovius (Rotterdam)

13:00 Luncheon and Trade Exhibitions

FREE PAPERS: TRAUMA
CHAIRMAN: MISS S M FULLILOVE/MISS C WILDIN

14:00 **What is the Science Behind the New Hand Fracture Implants?**
Mr D A Campbell (Leeds)

14:15 **Changes in Indications with the Newer Implants**
Mr M A C Craigen (Birmingham)

14:30 **Compression-Distrraction Method of Treatment of Patients with Hand Pathology**
Professor G Ismaylov (Tehran)

Introduction: High frequency of diseases and injuries of the hand, difficulty of treatment, considerable percentage of non-satisfactory outcomes explain the social and medical significance of the problem. The difficulty of treatment of patients with this pathology is not only restoration of anatomic integrity but also the function of the hand.

Material and Methods: Academician G A Ilizarov and his students elaborated and introduced new methods of treatment of patients with hand pathologies. The methods are based on original techniques of surgical intervention and post-operative treatment using new modifications of apparatus of external fixation.

I have treated one thousand three hundred and forty-two (1594 hands) patients in Russia, Great Britain and the Islamic Republic of Iran. The patients' age varied from one to 63 years. Patients suffered both congenital (69%) and acquired (41%) etiology of pathology. All patients suffered reduced ability to work and self-sufficiency. Marked cosmetic deformity compelled patients to use various methods of concealment.

Results: Follow-up of one month, 5 months and one year were traced in all patients, and distant results were followed in 79.3% of patients. In all cases good anatomic and functional results were obtained. The patients preserved sensitivity and movements in joints, were able to oppose the fingers with restoration of grip function, thus able to be independent.

Conclusion: To summarise, the versatility of the apparatus, possibility of gradual correction, sparing method of compression distraction transosseous osteosynthesis all combine to achieve the aims of treatment.

- 14:40 **Metacarpal Fracture Fixation: Comparison of Novel Technique (Intramedullary Interlock Nailing) with Conventional Intramedullary K-Wiring**
Dr M K Agrawal, Mr K J Patel, Mr S P Hodgson (Bolton)

Introduction: Indications and methods of surgical treatment of displaced metacarpal fractures are varied. Intramedullary interlocking nailing (Hand Innovations) for metacarpal fractures is a relatively new technique, which is indicated for rotationally unstable fractures. However, there is little evidence to compare the results of intramedullary nailing with conventional intramedullary K-wiring.

Materials and Methods: A retrospective study with review of case notes and radiographs was conducted for seventeen patients undergoing K-wiring and 15 patients undergoing intramedullary interlocked nailing between February 2007 and August 2007. All patients were followed up for at least three months.

Results: Both groups had patients with comparable demographic features, fracture patterns and mechanism of injury. The mean time for fracture union, both clinically and radiologically was 5.4 weeks for the K-wiring group and 6.2 weeks for the intramedullary locking nail group ($p>0.05$). Time of return to work was comparable in both groups. No rotational mal-alignment was noted in any patient at final follow-up.

All patients underwent removal of metalwork following fracture healing. All patients undergoing IM nailing had general anaesthetic for implant removal, as compared to four undergoing K-wiring. The complication rate was higher in the IM nailing group (4/15: stiffness, infection versus 3/17 for K-wiring group: infection, extensor tendon injury).

Conclusions: Intramedullary nailing is theoretically better for rotationally unstable metacarpal fractures, but our study shows no definite advantage over K-wiring. Also, the nail removal exposed the patients to additional risk of general anaesthetic, and increased cost of management, including cost of implant and removal.

- 14:45 **Inter-Observer Variation in the Radiographic Measurement of Fifth Metacarpal Neck Fractures**
Miss Z Goldthorpe, Mr S J Lee, Mr S M Wilson (Bristol)

Introduction: Fifth metacarpal neck fractures make up a significant proportion of hand trauma seen and treated by emergency departments and hand surgical units. Outpatient follow-up rates are less than satisfactory and treatment preference varies greatly between units. The degree of angulation determines necessity of surgical intervention, together with clinical examination. Our aim was to measure the inter-observer variation when assessing radiographs across specialities and grades to assess if further protocols regarding treatment can be instigated after initial assessment.

Methods: Five radiograph series (anteroposterior, oblique and lateral in four of the five fractures) of patients with 'boxers' fractures were reviewed independently by three consultants and three higher training grade doctors in emergency medicine, plastic surgery, orthopaedic surgery and radiology. Degree of angulation was tabulated for analysis.

Results: Scatter diagrams were created to visually assess the variance between the twenty-four subjects of all studied specialities and grades. Variability occurred between grades of the same speciality and most obviously between specialities. Inter-observer variance was found to be non predictable between specialities.

Clinical Relevance: This work suggests that radiographic assessment by a single clinician may lead to over treatment through referral for surgery, and the importance of clinical examination is to be reiterated. Decisions regarding initial treatment, surgery and follow-up require specialist input.

- 14:50 Discussion

14:57 **A Modified Approach of the Reverse Dorsal Metacarpal Island Flap: Anatomical Basis and Application in Twenty-four Cases**

Professor L J Lu, Professor G Xu (Chang Chun)

Introduction: The authors introduce a modified approach of the reverse dorsal metacarpal island flap (DMIF).

Material: We observed and measured the parameters of the distal cutaneous branches arising from the 2-4 DMCA in thirty-four specimens, and designed a new approach of the reverse DMIF. The axis of the flap is the midline between two adjacent metacarpals, from the leading edge of the web space to the metacarpal bases. Two points of pivot can be chosen, i.e. 2.5° or 1.5° proximal to the leading edge of the web space. The 2.5° point of pivot is the originating site of the cutaneous branch distal to the juncturae tendinum. The 2.5° point of pivot is chosen to cover the dorsum of the proximal phalanx. The 1.5° point of pivot is the site of anastomosis between DMCA and the common or proper palmar digital artery. The 1.5° point of pivot is used to cover volar or dorsal skin defect proximal to the DIP joint. The plane of dissection is along the extensor paratenon. From 2003 to 2006, we applied this approach in twenty-four patients.

Results: The 2nd and 3rd DMCA constantly gave off this cutaneous branch, but there was no cutaneous branch arising from the 4th DMCA in four among 34 specimens. All flaps survived completely except two cases of venous congestion, which were relieved through bleeding.

Conclusions: Based on the distal cutaneous branches arising from the 2-4 DMCA, the elevation of the reverse DMIF can be simplified.

15:07 **Resveratrol and Tendon Healing: More Reasons to Drink Red Wine**

Mr B Klass, Dr K J Rolfe, Mr A O Grobbelaar (Northwood)

Introduction: Flexor tendon adhesions remain a problem following primary tenorrhaphy. Resveratrol is a natural extract from red wine and grapes and has already been shown to reduce peritoneal adhesions in a rat model. Our aim was to determine if Resveratrol had the potential to reduce adhesion formation and optimise healing in flexor tendons using an in vitro model.

Materials and Methods: Rabbit flexor tendons were dissected and cultured separately as epitenon, endotenon and sheath cells. Cells were treated with 50µM Resveratrol over a time course. Real time PCR was performed on a number of genes associated with either wound healing [collagen type I and type III], or adhesion formation [fibronectin, plasminogen activator inhibitor-1 (PAI-1) and tissue plasminogen activator (tPA)]. Statistical analysis was performed using the relative expression software tool (REST®).

Results: Epitenon cells showed a significant increase in collagen type I gene transcription at four and 24 hours ($p < 0.01$) but a significant down-regulation of fibronectin and PAI-1 at 6 and 48 hours ($p < 0.01$). Sheath cells showed an increase in collagen type III at 48 hours ($p < 0.01$), a reduction in fibronectin at 2, 4, 6 and 24 hours ($p < 0.01$) and a reduction of PAI-1 at 6 hours ($p < 0.01$).

Conclusion: Resveratrol appears to optimise tendon healing through its effects on collagen type I and type III production. At the same time it potentially reduces adhesion formation through reduced transcription of fibronectin and PAI-1. These effects open the door for a novel adjuvant therapy at the time of primary tendon repair.

15:17 **The Accuracy of Ultrasound in Evaluating Closed Flexor Tendon Ruptures**

Dr O Gilleard, Dr Z Ahmad, Dr D Silver, Mr V Devaraj (Exeter)

Introduction: When injuries are caused by blunt trauma, or when re-rupture is suspected determining the integrity of the flexor tendons can be difficult. This paper examines the efficacy of ultrasonic examination in identifying closed flexor tendon ruptures.

Methods: Eighty cases of closed flexor tendon ruptures were investigated by ultrasound over a five-year period using the Toshiba APLIO 12.5 MHz musculoskeletal probe. Medical notes and radiology reports have been reviewed retrospectively in all instances.

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Results: Of the eighty cases identified, 56 were suspected closed ruptures secondary to blunt trauma, 4 were open injuries in which the diagnosis of flexor tendon rupture was not detected on initial assessment and 15 were suspected re-ruptures. Seventy patients underwent operation following ultrasound, enabling correlation in these cases to be made between radiological and intra-operative findings.

Sixty patients had ultrasonically diagnosed ruptures and in 58 cases the diagnosis was confirmed at operation. Of these, forty-seven had the proximal end correctly identified by ultrasound pre-operatively. The mean time from ultrasound to operation was 1.4 days and the mean time taken to complete the examination was 12 minutes.

Conclusions: This is the largest study to date that has investigated the accuracy of ultrasound in identifying closed flexor tendon ruptures. The results suggest that this modality has a high efficacy in identifying which patients need to undergo surgery and in a large proportion of cases can assist in operative decision making.

15:22 Discussion

15:30 Refreshments and Trade Exhibitions

FREE PAPERS – RHEUMATOID ARTHRITIS CHAIRMAN: PROFESSOR J STOTHARD/MR R MURALI

16:00 **The Role of Crossed Intrinsic Transfer in the Prevention of Recurrence of Ulnar Deviation after Metacarpophalangeal (MCP) Joint Replacement**
Mrs A Birch, Ms R Delaney, Mr I A Trail, Dr D Nuttall (Wigan)

Background: MCP replacements are frequently implanted in rheumatoid patients. Some surgeons believe in carrying out crossed intrinsic transfer at the time of the operation as a protection against recurrence of ulnar deviation. A randomised controlled trial was carried out to examine the benefits of this procedure.

Aim: To determine whether crossed intrinsic transfer protects against recurrence of ulnar drift following MCP replacement.

Method: Thirty-three patients were recruited, three of whom had bilateral surgery. Twenty-nine patients with 32 hands were available for analysis.

All patients were assessed for range of movement, grip strength and function, immediately pre-operatively, 3 months post-operatively, then annually up to five years. Patients were randomised into control group or crossed intrinsic transfer group. All operations were performed by the same surgeon. Post-operative management was the same for both groups.

Results: There were thirteen cases in the crossed intrinsic transfer group and 19 in the control group. Nine patients in the control group and 7 in the crossed intrinsic transfer group had reached 3 years or more. At three years there were no significant differences between the groups in ulnar deviation, extensor lag, grip strength, function score or pain. There was a significant difference in flexion, the transfer group having a lower range of flexion than the control group. Pain in the control group increased after three years.

Conclusion: At three years post-op crossed intrinsic transfer does not appear to protect against the recurrence of ulnar deviation. However the increase in pain in the control group needs further investigation.

16:10 **Tenosynovial Angiogenesis in Rheumatoid Hand Disease**
Mr M A Akhavan, Mr L Madden, Dr I Buysschaert, Dr E Paleolog, Mr N Kang (Northwood)

Introduction: Hypoxia and angiogenesis are important in the perpetuation of joint destruction in rheumatoid arthritis (RA). Proliferation and invasion of the tenosynovial lining of tendons in patients with RA can result in tendon damage and rupture, leading to decreased hand function. The purpose of this study was to investigate the functional relevance of hypoxia in terms of an angiogenic derive.

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Method: Patients undergoing elective hand surgery for RA were recruited into the study. RA tissue was harvested from the tenosynovium and cultured for twenty-four hours ex vivo under either hypoxic (1% O₂) or normoxic (20% O₂) conditions. The cells were lysed for mRNA determination using a QPCR, and the cell supernatants were used for protein determination using ELISA. An angiogenesis assay was used to study the functional angiogenic properties of the normoxic and hypoxic supernatants respectively.

Results: Hypoxia significantly upregulates the message and protein levels of the pro-angiogenic factors: vascular endothelial growth factor (VEGF), vascular endothelial growth factor-receptor-1 (VEGF-R1) and VEGF/PIGF heterodimer. Interestingly, placental like growth factor (PIGF) was significantly downregulated. The supernatants from hypoxic cell cultures demonstrated a significant enhancement of blood vessel formation in-vivo; when compared to the normoxic supernatants.

Conclusion: Hypoxia may be responsible for rendering RA tenosynovial lining pro-angiogenic and pro-invasive, thus facilitating the debilitating tendon ruptures observed in RA. Many of the drugs currently used to treat RA fail to prevent inflammation of the synovium in the hand. Further research is required to elucidate the exact mechanism by which hypoxia may lead to tendon rupture.

16:20

Matrix Metalloproteinase Regulation and Tendon Rupture in Rheumatoid Hand Disease

Mr M A Akhavan, Dr Y Itoh, Dr E Paleolog, Mr N Kang (Northwood)

Introduction: It is increasingly clear in rheumatoid arthritis, that the tendons rupture because their collagen structure is digested by matrix metalloproteinases (MMPs) released at the interface between the invading tenosynovium and the tendon. The aim of this study was to determine the role of hypoxia in controlling the release and function of MMPs by RA tenosynovial cells.

Methods: Tenosynovium was harvested from elective RA surgery patients. The RA cells were cultured for twenty-four hours under hypoxic (1% O₂) or normoxic (20% O₂) conditions. Levels of MMP mRNA and protein were measured using the PCR and ELISA techniques respectively. An in-vivo migration assay was used to determine the hypoxia and MMP dependent migration of the RA fibroblasts.

Results: Hypoxia resulted in significant upregulation in the expression of both mRNA and protein for MMP-2, MMP-8, MMP-9, MT1-MMP and downregulation of MMP-13. No changes were observed in the mRNA levels of MMP-1 and MMP-3, or the tissue inhibitors of matrix metalloproteinase (TIMP) TIMP-1 and TIMP-2. Hypoxia significantly enhanced the invasiveness of the RA fibroblasts in-vivo, which was reduced significantly in the presences of a universal MMP-inhibitor.

Conclusion: Hypoxia results in upregulation of many MMPs and increases the invasiveness of the RA fibroblasts, which have the ability to digest Type-I collagen in tendons. The invasive property is reduced in presences of a MMP inhibitor. Therefore, hypoxia may be responsible for the tendon ruptures observed in RA. Controlling the tissue response to hypoxia may provide an additional method by which the destructive effects of RA may be prevented or reduced.

16:25

Discussion

16:31

Grip Strength Characteristics Using Force Time Curves in Rheumatoid Hands

Mr H Singh, Professor J J Dias (Leicester)

Objective: To assess the effect of deformity on grip strength characteristics in rheumatoid hands using force time curves.

Methods: Forty-seven (6 females and 41 Males) patients with mean age 62 years (29-79 yrs) with rheumatoid arthritis had their hand grip strength measured with closed fluid dynamometer generating force-time curves. These were analysed to determine: 1) peak force; 2) average force; 3) time to peak; 4) and variance of the force data over the final 60% (plateau region) of curve. Data was also collected on joint mobility, pain and disability using Patient Evaluation Measure (PEM) and Functional Disability Scores (FDS).

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Results: The patients were divided into five deformity groups: no deformity, ulnar deviation, Boutonniere, Swan neck or combined deformities (2 or more deformities). These groups showed significant differences in grip strength (p value <0.01). Patients with a combination of deformities showed low peak and average forces measured on force-time curves. The hands with Swan neck deformities had the highest variability in the plateau region of the curve and had the greatest disability scores both with PEM and FDS scores (p value <0.005). This group was particularly disabled (p value <0.007) being less able to sustain the grip over time.

Conclusion: Swan Neck Deformity causes the most dysfunction due to its impact on strength.

16:36

Ability of Gloves to Simulate Hand Arthritis

Dr T Hall, Mr M F Nixon, Professor J J Dias, Mrs T A Graham, Ms S Cook (Leicester)

Introduction and Methods: This project assessed the ability of two gloves designed to simulate hand arthritis. Fourteen healthy volunteers had grip strength and Sollerman hand function assessed in their dominant and non-dominant hands. Assessments were made without any glove, with glove A (simulating stiffness only) and glove B (simulating stiffness and pain).

Results: In the dominant hand without a glove, the mean grip strength was 34kg (SD 8.9) and mean Sollerman function 99% (SD 1.2). With glove A the grip was reduced by a mean of 40% to 20.5kg (SD 7.6) and the Sollerman function by 6% to 93% (SD 2.3, both p<0.001). With glove B, the mean grip strength was reduced 41% to 20.0kg (SD 6.7) and the Sollerman function by 8% to 92% (SD 4.3, both p<0.001). There was no significant difference in grip strength of function between gloves A and B. Similar findings were made in the non-dominant hand.

Conclusions: Both gloves accurately simulate a reduction in power, but are less able to simulate reduction in function. These findings need correlation to patients suffering hand disorders. Such gloves would assist in development of tools and aides, which accommodate for hand disorders.

16:41

Surgery in Non-Rheumatoid Inflammatory Arthritis of the Hand

Mr D M Evans (Windsor)

16:56

Discussion

17:05

Business Meeting (open to Full Members and Associates only)

19:30 for

20:00

Society Dinner – The City Rooms

FRIDAY, 2 MAY

- 08:30 Registration
- 08:59 Welcome by the President
- 09:00 **BSSH Research Agenda**
Mr J L Hobby (Basingstoke)

FREE PAPERS – WRIST **CHAIRMAN: MR B BHOWAL/MR I S H McNAB**

- 09:30 **Vascularized Capitate Transposition for Advanced Kienböck's Disease: Application of Forty Cases and its Anatomy**
Professor L J Lu, Professor G Xu (Chang Chun)

Introduction: We introduce the design and experience of vascularized capitate transposition for advanced Kienböck's Disease.

Material: Based on anatomic study, we designed a new method, i.e., vascularized capitate transposition, to replace excised necrotic lunate, which was applied in forty cases. It includes excision of the necrotic lunate and proximal shift of the vascularized capitate. The blood supply of the transposed capitate is provided by the dorsal branch of the anterior interosseous artery.

Results: Bone union occurred radiographically and no post-operative capitate necrosis was noted in any case after six weeks. Twenty-three cases were followed up for one year. No residual wrist pain existed in unloaded range of motion, but limited residual wrist pain existed during work activities. The arc of motion ranged from 35 degrees flexion to 45 degrees extension. The grip power of the affected hand averagely reached 70% compared with the contralateral.

Conclusion: The authors conclude that vascularized capitate transposition is a reliable alternative for advanced Kienböck's disease.

- 09:40 **Scaphocapitate Arthrodesis – A Report of Forty-seven Cases**
Dr P Saffar (Paris)

- 09:55 **Four-corner Fusions Using Circular Plates - Does the Choice of Bone Graft Contribute to Non-union?**
Mr S K Khan, Mr S Haleem, Mr S M Ali, Mr A McKee, Mr J W M Jones (Peterborough)

Background and Aim: Non-union is the most commonly reported complication in four-corner fusions using circular plates, and several factors have been implicated in its causation. We aimed to identify non-unions in a series of four-corner fusions at our institution, and to compare these with previously reported results.

Methods: A retrospective review of case notes and radiographs of patients who underwent four-corner fusions, using the Acumed "Hubcap" eight-hole circular plate. All patients were followed up at regular intervals, and were assessed for complications including non-union. A literature search revealed ten case series (164 followed-up patients) for the 'Spider Limited Wrist Fusion Plate', which is a similar annular implant in use since 1999. We paid attention to the description of surgical technique, source and quality of bone graft used, and post-op assessment of union.

Results: Eleven patients (7 males, 4 females, mean age 48 years) were treated for SLAC, SNAC, and other carpal degenerative conditions. All had scaphoid excision, which was morcelised and used as autogenous bone graft. Complications included broken screw, infection, median nerve compression and persistent ulnar impingement (1 case each). There was no radiological evidence of non-union in any of the cases. In the ten series with Spider Plates, non-union rates ranged from 0% to 62%. Surgical technique was well described by four authors. The graft sources included scaphoid (57), distal radius (31), and allografts (4).

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Discussion: The choice of bone graft (scaphoid vs distal radius vs mixed) does not seem to affect union. Conventional radiographs can potentially miss non-unions, due to the concealment effect of plate size and overhanging edges. We therefore recommend CT scans to better appreciate bone consolidation.

10:00

Interventions for Treating Metaphyseal Distal Radius Fractures in Children: A Cochrane Systematic Review and Meta Analysis

Mr A Abraham, Ms H Handoll, Mr T Khan (Leicester)

Introduction: We studied the position of immobilisation and optimum length of casts. For displaced fractures we investigated the role of K-wire stabilisation.

Material and Methods: Search strategy: We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (May 2006), the Cochrane Central Register of Controlled Trials (The Cochrane Library 2005, Issue 2), MEDLINE, EMBASE, CINAHL and reference lists of articles.

Selection Criteria: Any randomised or quasi-randomised controlled trials, which compare types and position of casts and the use of wire fixation for distal radius fractures in children.

Data Collection and Analysis: All authors performed trial selection and independently assessed methodological quality and extracted data. Where appropriate, results of comparable studies were pooled.

Results: Pooling of data from three studies yielded a RR (Relative Risk) for re-manipulation following K-wire stabilisation versus MUA (Manipulation Under Anaesthetic) and cast only of 0.06 (P = 0.0005). Pooling from two studies was possible to assess the difference between long and short casts for displaced fractures. Combined data indicated no statistical difference between the two groups with an RR of 1.11 (95% CI 0.68 to 1.79) for loss of reduction.

Conclusions: A paucity of studies and significant diversity in outcomes observed, prevented extensive pooling of data. Pooling from three studies revealed a lower re-manipulation rate in displaced fractures following K-wire stabilisation versus MUA and cast alone. Pooling from two studies revealed no difference in loss of reduction between short and long casts for displaced fractures.

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Discussion

10:13

Which Cast – Colles' or Scaphoid? A Survey of Conservative Management of Scaphoid Fractures in the UK

Mr T G Petheram, Mr S Garg, Mr J P Compson (London)

Introduction: Randomised controlled trials have shown Colles-type casting to be adequate for conservative management of undisplaced scaphoid fracture when compared to scaphoid-type cast including the thumb. A further randomised trial has shown below elbow casting in slight extension, compared with slight flexion, to be better for regaining full wrist extension after cast removal, whilst having no effect on fracture union. We carried out a questionnaire survey of two hundred consultant orthopaedic surgeons, including 41 members of the British Society for Surgery of the Hand, to see if this evidence was reflected in current UK practice.

Method: We gathered seventy-three completed questionnaires, of which 62 (85%) regularly managed scaphoid fractures. We gathered information on possible, probable and definite fracture management.

Results: For definite fractures 40% (25) of consultants used below-elbow (thumb free) cast, 57% (35) continuing to use scaphoid-type cast (including the thumb). No difference was found between members of the British Society for Surgery of the Hand and non-members. Looking at inclination of casting in flexion or extension, variation again existed, with a trend towards casting in neutral, thirty-five (68%) surgeons casting in neutral, 10 (20%) in extension and 6 (12%) in flexion.

Conclusion: We demonstrated a wide variation in current UK practice. We recommend that more surgeons convert their practice to reflect current evidence, with below elbow casting without thumb inclusion and in slight extension. This gives patients a less restricting experience as their fractures heal without compromising outcome.

10:18

Percutaneous Fixation of Scaphoid Non-Union: A Follow-up Study of Radiological and Functional Outcomes

Mr D Armstrong, Mr A Logan, Mr C Heras-Palou (Derby)

Introduction: Scaphoid fractures are the second most common fracture of the upper limb. It usually occurs in men (80%) with a peak incidence between the ages of 20-30. They are normally caused by a fall onto the outstretched wrist and account for 80% of carpal fractures (Hove LM, 1999).

Method: We reviewed eleven patients from a cohort of 23 patients who were identified from departmental databases as having had percutaneous fixation of the scaphoid for delayed union. All those identified were male.

Patients who attended underwent a basic questionnaire of hand dominance, injured hand, DASH questionnaire (including Sports and Work), JAMAR grip strength and a Visual Analogue Scale measurement of ongoing pain in the injured hand.

Results: Eight patients were white-collar workers, 2 were blue-collar and 1 was unemployed.

Average Values

| | | |
|--------------------------|-------|------------------|
| Right hand grip strength | 48 | (range 31 – 72) |
| Left Hand grip strength | 47.9 | (range 32 – 68) |
| DASH | 11.43 | (range 0 – 37.5) |
| VAS | 2.82 | (range 0 - 5.4) |

On computerised tomography, three scaphoids had not united; six had completely united; the remaining two had mixed bony and fibrous union.

Non-unions had an average VAS of 0.9, DASH of 2.8. Unions (partial or complete) had an average VAS of 2.56, DASH of 14.7. (Partial union - average VAS of 1.85 and DASH of 4.7. Full union - average VAS of 1.43 and DASH of 16.5).

Conclusion: Using a percutaneous technique CT scans suggest a (total or partial) union rate of 72% in this small series.

10:23

Complications following Trapeziectomy

Mr J Fischer, Mr D Quinton (Derby)

Introduction: Trapeziectomy +/- LRTI is the standard operative treatment for base of thumb arthritis. There are, however, a number of complications associated with this procedure, some of which can be difficult to treat. We have reviewed a series of trapeziectomy patients and analysed frequency, assessment and treatment of complications. We discuss the available literature and suggest ways of assessing and treating patients with complications.

Methods: Analysis of notes of all patients undergoing trapeziectomy +/- LRTI as the primary procedure for the treatment of base of thumb CMC-joint arthritis in the years of 2000-2005. One hundred and three patients (118 cases) were identified. Data collection included surgical approach, surgeons grade, surgical technique, additional procedures, post-op immobilisation, complications and their assessment, treatment and outcome.

Results: There were thirty-seven complications (31%). The most common was residual pain at the base of the thumb (15 cases). Patients with residual base of thumb pain responded better to steroid injections, than patients with no treatment or splints/physio. SBRN numbness as well as dysaesthesia settled in all patients.

Conclusions: In patients with residual pain, potentially treatable causes have to be ruled out first. The true source of pain in the remaining patients is difficult to isolate and we recommend early injection of

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steroids in this group. SBRN related symptoms might settle with time. Persistent painful dysaesthesia should be investigated with a diagnostic injection of local anaesthetic of the posterior interosseous nerve. The significance of co-existent arthritis of the scapho-trapezoid joint and the role of preventative ST-joint excision is unclear.

10:28 Discussion

10:35 Refreshments and Trade Exhibitions

11:05 **Continuing Professional Development: What can the BSSH do for you**
Mr D Warwick (Southampton)

11:25 **Archiving Videos of Hand Conditions**
Professor F D Burke (Derby)

GUEST LECTURE
CHAIRMAN: PROFESSOR J J DIAS

11:35 **Trauma Surgery in the Napoleonic Wars**
Mr M Crumplin

12:20 Luncheon and Trade Exhibitions

13:15 **THE GEOFFREY FISK SYMPOSIUM OF THE ZIGZAG WRIST**
CHAIRMAN: PROFESSOR J K STANLEY

13:20 **Soft Tissue Procedures: What Works**
Dr M Garcia-Elias

13:35 **Bone Procedures: What Works**
Dr P Saffar

13:50 **Long-term Results of Partial Wrist Fusions**
Dr M Garcia-Elias

14:05 Discussion

FREE PAPERS – NERVE AND MISCELLANEOUS
CHAIRMAN: MR A N M FLEMING/MISS J S ARROWSMITH

14:15 **Brachial Plexus Injury: How to Assess and When to Refer**
Professor S P J Kay (Leeds)

14:45 **Payment by Results (PbR): Implications for Elective Hand Surgery and Therapy**
Dr M K Agrawal, Mr K J Patel, Mr R Parr, Mr S P Hodgson (Bolton)

Background: This system of funding has been in place for two years. It is likely to evolve further with increasing impact on the planning, delivery and indeed potential viability of services. Important questions will have to be answered. Are all services available? Which specialities/sub-specialities offer the best use of resources (income vs. expenditure)? Is post-operative therapy adequately funded?

Material and Methods: We have examined the income, volume and costs incurred in treating the common elective hand surgery conditions (carpal tunnel syndrome, Dupuytren's disease, trigger digits and ganglion) and compared with other orthopaedic conditions and the private sector.

Results:

| | |
|------------------------------|-------|
| PbR income | |
| Carpal Tunnel Release | £ 724 |
| Dupuytren's Fasciectomy | £1343 |
| Dupuytren's Dermofasciectomy | £1343 |
| Trigger Digit Release | £971 |
| Ganglion excision | £724 |

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Annual income for the above procedures (Bolton) is approximately £0.5 million. Potential sessional (3.5 hours) income is twice as high for trigger/carpal tunnel than Dupuytren's surgery. Potential sessional income for hand surgery is 25-30% of that for lower limb arthroplasty but costs are significantly less. Hand surgery income is greater than costs for all except Dupuytren's surgery. Number of post discharge therapy sessions undetermined and largely unfunded. Relative income from PbR different than in the private sector.

Summary: Elective hand surgery is high volume with relatively low income but generally low cost. Dupuytren's surgery is relatively under-rewarded and potentially loss making, particularly if post-operative therapy is considered. The data provides some answers to questions posed regarding PbR and may help argue the case for continued investment in hand surgery services.

14:55

Natural History of C7 Root and Long Thoracic Nerve Lesions in Supraclavicular Brachial Plexus Injury

Mr T Hems (Glasgow)

Introduction: Knowledge of the natural history of injury to different elements of the brachial plexus is important in decisions for reconstructive surgery. This study is to assess outcome, without surgical repair, for injury to C7 and the long thoracic nerve (LTN) in supraclavicular plexus injury.

Methods: Thirty-five patients (mean age 27, range 16 to 46) with closed supraclavicular traction injuries were treated between 1997 and 2005. At minimum follow-up of two years recovery of C7 and LTN were assessed as good, fair or poor.

Results: Twenty-four patients had surgical exploration for injuries including C7. Eight had injury to C5, 6, 7; 6 to C5, 6, 7, 8; and 10 had complete injuries. Thirteen of these patients had clear rupture or avulsion of C7 and there was no recovery. Eleven had a lesion-in-continuity (LIC) with no response to stimulation. Sensory Evoked Potentials (SEP) were absent in four of 5 patients in whom this had been recorded. Of the eleven cases with LIC of C7, 8 patients had good recovery, 2 fair, and one poor.

The LTN was affected in fourteen patients who underwent exploration. No useful recovery occurred in nine patients who had no response to stimulation of the LTN. Five patients who had a small response to stimulation went on to good recovery.

Conclusion: These results suggest that spontaneous recovery is likely in C7 if a LIC is found on exploration. Recovery is unlikely in the LTN if there is no response to stimulation, but a small response is associated with a good prognosis.

15:05

Discussion

15:13

Outcome of Carpal Tunnel Decompression: The Influence of Age, Gender and Occupation

Mr I Majid, Mr T Ibrahim, Mr M Clarke, Mr C Kershaw (Leicester)

Aim: To investigate the effect of age, gender and occupation on the outcome of carpal tunnel decompression.

Methods: We prospectively reviewed all patients with carpal tunnel syndrome who underwent primary surgical decompression by a single operator over a seventeen-month period. Outcome was assessed using the Brigham carpal tunnel questionnaire two weeks pre-operatively and six months post-operatively. Cases were divided into four age groups (less than 40 years of age, 40 to 59, 60 to 79, and over 80 years) and two occupation groups (repetitive and non-repetitive). Statistical analysis was performed using Kruskal-Wallis and Mann Whitney-U tests.

Results: A total of four hundred and seventy-nine patients (females = 342 and males = 137) undergoing 608 primary carpal tunnel decompressions were studied. The mean differences for both the symptom-severity ($p=0.21$) and functional-status ($p=0.29$) scores amongst the four age categories were similar. We also found no difference between symptom-severity ($p=0.66$) and functional-status ($p=0.40$) scores between the genders.

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Occupation was recorded in two hundred and ninety-seven out of the 479 patients (females = 222 and males = 75). The majority of patients (223) were categorised to the non-repetitive group. The mean differences for both the symptom-severity ($p = 0.77$) and functional-status ($p = 0.32$) scores between the two occupation groups were similar and no significant difference was found. Overall, 93% of patients improved following carpal tunnel decompression.

Conclusion: The majority of patients improved after carpal tunnel decompression. However, we found no influence of age, gender and occupation on the outcome of carpal tunnel decompression in our series of patients.

15:18

Carpal Tunnel Syndrome is Best Assessed by Hand Elevation Test Only

Mr R Amirfeyz, Mr B Parsons, Mr R Melotti, Mr G Bannister, Mr I Leslie, Mr R Bhatia (Bristol)

Introduction: Carpal tunnel syndrome (CTS) can be diagnosed by a variety of diagnostic tools. Should all of them be employed when a patient is being clinically evaluated? Or is there a “most accurate and useful combination” which will suffice?

Material and Methods: Seventy patients with CTS (confirmed by electroneurophysiological studies) and 70 normal individuals were prospectively evaluated by Tinel sign, Phalen test, carpal compression test, tourniquet test, hand elevation test, Katz’s hand diagram, sensibility assessment by Weinstein monofilament test and static two point discrimination. Univariate association between CTS and each test was assessed by chi-square for nominal data and Mann-Whitney for ordinal data. All variables achieving a p value of 0.05 in univariate analysis were included in the regression analysis. Stepwise logistic regression was then used to determine significant variables, thus accounting for best possible combination of tests.

Results: Stepwise regression analysis favoured the combination of Phalen, carpal compression and tourniquet tests as the most likely combination to diagnose CTS with an area of under the curve of 0.9874 ($p=0.001$). Hand elevation test on its own had a 0.995 area under the curve ($p=0.0005$).

Conclusion: Hand elevation test is the best test to detect CTS and the accuracy of this test is not increased by combining it with any other clinical tools.

15:23

Using the Patient Evaluation Measure to Audit Carpal Tunnel Surgery in our Unit

Mr M Cartwright-Terry, Mr A Miah, Mr R Savage (Newport)

Introduction: The Patient Evaluation Measure (PEM) was designed at the Derby consensus meeting in 1995. It was validated for Carpal Tunnel Syndrome (CTS) in 2005 (Hobby et al) and was preferable to the DASH score for CTS assessment. We set out to audit CTS treated by surgical decompression in our unit using the PEM, and to compare our results with the published literature.

Methods: Thirty consecutive patients were questioned about one hand. Patients completed a pre-operative PEM and a post-operative PEM at three months.

Results: Mean PEM scores improved from 41.3 to 23.9 ($P<0.001$). Individual questions showed statistically significant improvements in mean scores: feeling in the hand, cold intolerance, pain, dexterity, movement and hand in general (all $P<0.001$); work ($P<0.005$); ADL ($P<0.01$); movements, grip and appearance ($P<0.05$). Our results are similar to previously published series, both overall, and for individual questions in the PEM.

Conclusion: Results from carpal tunnel decompression in our unit match those of other units. We found the PEM was easy to use and effective, both in the assessment of patients with CTS and for outcome measurement following surgical decompression. Our study supports the idea that the PEM could be used widely as an audit tool to assist hand surgeon and/or hand surgery unit appraisal.

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15:28 **Katz and Stirrat Hand Diagram Revisited**
Mr R Amirfeyz, Mr R Bhatia, Mr I Leslie (Bristol)

Introduction: Katz and Stirrat self-administered hand diagram for the diagnosis of carpal tunnel syndrome (CTS) is in use in the pre-hospital community setting. The reliability of this diagnostic tool is revisited here.

Material and Methods: Twenty-five patients with CTS (confirmed by electroneurophysiological studies), 25 with other hand or wrist pathologies and 25 normal individuals were prospectively evaluated by the self-administered hand diagram. Sensitivity, specificity, positive and negative predictive values were calculated. The diagrams were blindly scored by two experienced hand surgeons on two different settings three weeks apart. Inter-observer and intra-observer reliability were assessed.

Results: Hand diagram had a sensitivity of 58.7%, specificity of 80%, positive predictive value of 89.9% and negative predictive value of 39.2%. 95% correlation interval was 0.33–0.65 for intra-observer measurement. Kappa value of 0.241 showed a fair agreement in between the two observers.

Conclusion: Hand diagram has a low sensitivity and negative predictive value. The inter-observer agreement is fair and intra-observer repeatability is poor. This tool is neither sensitive enough nor reliable to be used as a tool in the assessment of CTS. A thorough history and appropriate clinical examination is more accurate for the diagnosis of CTS.

15:33 Discussion

15:45 Conclusion
Professor J J Dias (Leicester)

15:50 Close of Meeting and Refreshments

POSTERS

1 **Pain Tolerance with a Novel Tourniquet in Hand Surgery – A Comparative Study**

Mr A Mohan, Mr M Solan, Mr P Magnussen (Guildford)

SMARTTM (OHK Medical Devices, Haifa, Israel) is a novel tourniquet system, which has shown good results in upper limb surgery under local anaesthetic.

A review of literature showed that no pain tolerance study has been done with the use of this tourniquet system. We conducted this study to assess the pain-tolerance of the SMART tourniquet with a pneumatic tourniquet. In the first arm, data was collected by applying the pneumatic tourniquet over the arm and the SMART tourniquet over the forearm. In the second arm, the pneumatic tourniquet and the forearm tourniquet were applied to the forearm.

Twenty volunteers, 10 men and 10 women, aged 23-55 years were randomised into two groups. Each tourniquet was applied by the same investigator (AM).

Pain and parasthesias were scored in the patients at one minute, 5 minutes and 10 minutes in both arms of the study. In the first arm parasthesias were more with the pneumatic tourniquet as compared to the SMART. In most of the patients ulnar nerve parasthesias were more prevalent. In two patients the pneumatic tourniquet had to be removed because of unbearable pain and parasthesias. In the second arm pain was more with the SMART tourniquet in the first minute but after that it was equal to the pneumatic tourniquet or less at 5 minutes. Parasthesias were more with the pneumatic tourniquet.

In conclusion, SMART tourniquet is a good tourniquet for hand surgery as it has comparatively better pain tolerance and produces less parasthesias as compared to pneumatic tourniquet.

2 **The Use of Vicryl™ in Extensor Tendon Repairs**

Mr R Y Kannan, Mr E K Tan, Mr R E Page (Sheffield)

Introduction: Non-absorbable suture materials such as Prolene® are considered optimal for suturing most tendon repairs. While logical for the strong, round flexor tendon system, we question the validity of this approach for the flat, extensor tendons. Anecdotal evidence suggests that non-absorbable sutures on the surface of extensor tendons tend to promote a foreign-body reaction, inhibit remodelling and cause increased tendon tethering. In this study, we compared primarily Vicryl™ and Prolene® sutures for this repair.

Materials and Methods: A retrospective case study involving one hundred and twenty patients (119 males and 9 females) with 200 combined extensor tendon repairs either with Vicryl™, Prolene®, Ethilon® or PDS® sutures. Combined flexor and extensor tendon injuries or rheumatoid arthritis-related tendon ruptures were excluded in this study.

Results: In the Vicryl™ group, the final range of the MCP joint was eighty-three \pm 13 degrees while the PIP joint motion was 76 \pm 24 degrees. In the Prolene® repair group, the measurements were seventy \pm 24 degrees and 68 \pm 25 degrees for the MCP and PIP joints. While there was no statistical significance between the means of each group (one-way ANOVA test), there was a significant difference in variance between the Vicryl™ and Prolene® groups (Bartlett's test for equal variances, $p < 0.05$). In short, there was no difference between Vicryl™ and Prolene® sutures for extensor tendon repairs but if tethering were to occur, it would be more severe in the Prolene® group.

3 **Flexor Tendon Repair Simulator**

Mr A T Sillitoe, Mr D Taylor, Mr A Williams, Mr S W McKirdy, Mr C Duff (Preston)

Flexor tendon repair has been accurately described as an exacting and demanding technique (1). As with all surgical procedures flexor tendon repair has its learning curve reflecting the fact that experience of the technique leads to better results. The likelihood of failure is user dependent (2,3).

Likely causes of early failure are surgical, due to insecure knots, gaping at the repair site, inaccurate placement of the suture (3,4) and inadvertent damage to the suture material (2,3).

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Additionally, with the reduction in juniors' hours and resultant reduction in operative exposure, plus the newly introduced training curriculum requiring competency-based assessments such as DOPS, Direct Observation of Procedural Skills, there is increasing demand for surgical simulation.

Previously published models, using pig tendons (1), don't allow visualization of the needle or suture placement, whilst others using catheters, which are 'hollow' vessels, don't allow core suture placement (5).

We present a model, utilising a silastic rod, as a tendon repair simulator.

Our simulator is simple, easy to assemble, inexpensive, safe and reliable, giving a realistic representation of the surgical setting.

The rods are solid and transparent, therefore not only allow the practice of placement but also visualisation of the core suture by the trainee. In addition the supervising surgeon can assess the quality of the repair technique and thus the competency of the trainee prior to allowing them to perform repairs on patients, an important issue in the age of competency-based assessment.

4 **Negative Exploration in Soft Tissue Hand Injuries**

Mr S Chummun, T Winwood, S Wilson (Bristol)

Aim: We investigated the rate of negative exploration in soft tissue hand injuries and compared the pre- and post-operative findings of SHOs (Senior House Officers) vs. SHO/Registrars in the assessment of hand injuries.

Materials and Methods: Fifty consecutive patients with soft tissue hand injuries referred to the Frenchay Plastic Surgery Unit were prospectively recruited. SHOs and registrars in the unit were not informed of the study. Pre- and post-operative diagnoses were obtained from assessment and operation notes. All cases were discussed at a consultant-led trauma meeting prior to going to theatre.

Results: Fifty patients (36 males vs. 14 females) were recruited. The age range was 11-76 years, with a median age of 26 years. There were twenty-four work-related accidents, with injuries with metal objects being the commonest (16), while glass injuries (13) were the commonest cause among the 26 domestic injuries.

Forty patients were initially assessed by SHOs only prior to going to theatre, compared to 10 patients assessed by SHOs and registrars. Eight out of 10 cases reviewed by registrars pre-operatively were correctly diagnosed. A negative exploration was noted in two cases. No new finding was made intra-operatively.

A negative exploration was noted in two out of the 40 cases in the SHO only group. Of the thirty-eight cases with positive findings, 12 additional injuries were noted intra-operatively.

Conclusion: Our negative exploration rate was 8%. Senior review of patients reduced the incidence of injuries found intra-operatively, thus highlighting the importance of patients being assessed in trauma assessment clinics.

5 **An Instructional Review of Military Hand Trauma: Learning from Past Experience and Embracing Emerging Concepts**

Major W Eardley, Major R Anakwe, Lt Col D Standley, Col M Stewart (Middlesbrough)

Aim: To review the changing pattern of orthopaedic injury encountered by deployed troops with special regard to the importance of hand trauma sustained in conflict and non-war fighting activities.

Method: Literature review relating to recent military operations (1990 – 2007) encompassing sixty conflicts worldwide. A subsequent search was performed to identify papers relating to hand injuries from 1914 to the present day. Papers were graded by Oxford Centre for Evidence-based Medicine Levels of Evidence.

Results: Four hundred and sixteen published works were analysed. Review of the literature revealed a lack of statistical analysis and a tendency towards the anecdotal. These works were primarily level five evidence, comprising reviews, correspondence, sub-unit experiences and individual nation database analyses. The importance of extremity trauma is clear. The combination of changing ballistics and increasing survivability off the battlefield leads to a previously under-emphasised increase in complex hand trauma. Hand trauma is also shown to occur in

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deployed troops during activities unrelated to war fighting. Articles concerning military hand trauma management were mainly published prior to the conflicts of the last decade. Within these papers injury classification and treatment priorities are highlighted as core knowledge for trauma surgeons.

Conclusion: This paper provides a review of conflict related injury patterns with special regard to hand trauma. The key learning points from historical literature are highlighted. Proposals for improving management of these injuries from battlefield to home nation are discussed with regard to training opportunities and dialogue to ensure past lessons are not forgotten.

6 **The Posterior Lateral Approach to the Distal Humerus**

Mr D E Deakin, Mr P Dhillon, Mr S C Deshmukh (Birmingham)

Introduction: Several posterior approaches to the elbow have been described. We present a new approach to the elbow via the lateral border of the triceps muscle.

Operative Technique: A posterior midline incision is made and the skin and subcutaneous tissue are reflected. The ulnar nerve is identified. A plane is developed between the lateral border of the triceps and the lateral intermuscular septum. As this plane is continued distally the fascia covering anconeus muscle is divided. The distal insertion of anconeus is partially detached exposing the medial ulnar. As the triceps mechanism is reflected medially, the origins of flexor carpi ulnaris (FCU) and flexor digitorum profundus (FDP) are partially reflected subperiosteally from the lateral border of the ulnar. The ulnar nerve lies undisturbed on the outside of the medially reflected triceps.

Discussion: We have used this exposure routinely for total elbow replacements and fixation of intraarticular fractures of the distal humerus in ten patients since 2005. No cases of post-operative ulnar nerve neuropraxia or wound problems have been encountered. Previously described approaches include the olecranon osteotomy, lateral reflection of the triceps and triceps-splitting approaches. This approach has not been described. Non-union rates associated with olecranon osteotomy are 2%. Lateral reflection of the triceps involves mobilising the ulnar nerve and post-operative ulnar nerve neurapraxia has been reported in the region of 10%. Splitting the triceps disrupts the extensor mechanism. This approach avoids these problems, whilst still achieving excellent exposure of the distal humerus and proximal ulnar.

7 **Carpal Tunnel Syndrome: Validation of a Clinic Based Nerve Conduction Measurement Device**

Mr T Green, Dr M Kallio, Dr V Lesonen, Professor U Tolonen, Mr M Clarke, Mr P Pathak (Leicester/Oulu)

Introduction: Measurement of sensory latencies across the wrist in carpal tunnel syndrome can now be performed by non-specialists using commercially available devices. One such device, Mediracer, has been suggested by the UK Department of Health as being worthy of further assessment (Transforming clinical neurophysiology diagnostic services to deliver 18 weeks - DoH 2007). Our study compared this device against standard neurophysiological measurements.

Methods: Sixty-three subjects were recruited. All were referred complaining of symptoms in one or both hands, such that it was thought they might have carpal tunnel syndrome. They were consented to receive bilateral traditional nerve conduction studies carried out by neurophysiologists and new device measurements carried out by Orthopaedic staff. The study was approved by the Ethics Committee.

Results: The latency differences between ring finger stimulation evoked median nerve peak latency (4PM) and ulnar nerve peak latency (4PU) were compared using regression analysis. The latency differences between index finger stimulation evoked median nerve peak latency (2PM) and ring finger stimulation evoked ulnar nerve peak latency (4PU) were compared using the same analysis.

4PM-4PU latency difference between traditional studies and the new Mediracer device had a correlation coefficient of 0.88 ($p < 0.0001$), and 2PM-4PU latency difference 0.95 ($p < 0.0001$).

The new device produced comparable results in one hundred and nineteen out of 126 hands tested (sensitivity 94%). If only symptomatic hands were tested, the sensitivity rose to 97%. There were no false positives.

Conclusion: We conclude that the Mediracer device demonstrates a high degree of concordance with currently available nerve conduction testing.

POSTERS

8 **An Audit of Time to Theatre for Open Hand Injuries in a Tertiary Referral Centre**

Dr M Tan, Miss R Dale, Miss K Owers (London)

Introduction: Hand trauma is common and 20% of cases presenting to the Emergency Department require surgery. Risks of delayed surgery include infection and delay to rehabilitation with subsequent loss of function. Following recently published BSSH guidelines, our Hand Unit aims to treat all open hand injuries within 48 hours of injury and badly contaminated wounds including open joints/fractures within 12 hours. We performed an audit to establish if we were meeting our targets.

Method: Data from all referrals accepted to the Hand Unit was prospectively collected over one month. Details recorded included time and mechanism of injury. Theatre logbooks were used to ascertain the time of surgery and any reasons for delay. Patients with insufficient data to calculate waiting times and those presenting over 48 hours post-injury were excluded.

Results: 71/89 patients accepted by the Hand Unit met the criteria for inclusion. 22/71 were children and 100% had surgery within 48 hours. 23/49 (46.9 %) of adult patients had surgery within 48 hours. Of those requiring urgent surgical intervention, only 33.3% received it within 12 hours. Reasons for delay included lack of theatre space (26.1%), allocation to semi-elective day surgery slots over 48 hours post-injury (56.5%), and delay in presentation/referral (8.7%).

Conclusion: The Hand Unit is currently not meeting its aims. We suggest the service could be improved by provision of dedicated hand surgery emergency lists and education of on-call doctors and referring hospitals regarding BSSH guidelines. We discuss methods of implementing these suggestions and propose to re-audit in six months.

9 **An Audit of Flexor Tendon Injuries**

Miss N Breitenfeldt, Mr V Moonesamy, Mr A Watts (Exeter)

Introduction: Flexor tendon injuries of the hand are common. Rupture rates following repair are reported in the literature as 3-9% for finger/wrist flexors and 3-17% for FPL injuries. We performed an audit of process and outcome to determine the rupture rate in our department and to identify any associated factors.

Method: A retrospective analysis of hospital records, identified from our computerised operation logbook and physiotherapy database. All patients undergoing primary repair of a thumb, finger or wrist flexor tendon in our department during 2006 were included. The data collected included patient age, hand dominance, occupation, the zone and mechanism of injury, delay to repair, operative technique and follow-up, including the nature and compliance with hand therapy.

Results: Seventy patients were identified with 113 flexor tendon injuries. Of these, six patients were known to have had an acute rupture following primary repair, all involving finger flexors (8.6% of patients, 5.3% of tendons). Factors associated with acute rupture were injury to the dominant hand, zone and mechanism of injury and lack of compliance with post-operative hand therapy.

Conclusions: The rupture rate following flexor tendon repair in our department is similar to rates reported in the literature. However, documentation was poor and needs to be improved. Rupture rate following flexor tendon repair could be used nationally as a comparative interdepartmental outcome measure. However, in order to be meaningful, further work is needed to assess the factors associated with poor outcome and to identify potential mechanisms for improvement.

10 **Transient Nail Growth Arrest Due to Nerve Injury**

Mr K Deogaonkar, Mr J Elliott (Belfast)

Injury to a particular nerve leads to transient growth disturbance of the nails in the dermatomes supplied by the nerve.

A young lady fractured her ulna and injured the ulnar nerve (neurapraxia) whilst playing Camogie, a Celtic team sport. The fracture healed after internal fixation. However she developed transient growth arrest of the nails in the three ulnar digits. The worried patient eventually has full regrowth of the involved nails as her nerve injury recovered.

POSTERS

Nails in the dermatomes supplied by a particular nerve undergo trophic changes when the nerve is injured and recover along with the nerve.

11 **A Review of the Epidemiology and Management of Hand Fractures at the Frenchay**

Miss K Hazen, Mr M Lamyman, Mr S Wilson (Bristol)

Introduction: Hand fractures are common. Such patients make up a significant proportion of the emergency workload for the service. Many require surgical intervention. The aims of this study were to gather information on the epidemiology of these fractures and their management in our department.

Material and Methods: This prospective study included all patients presenting with fractures of the phalangeal or metacarpal bone, in a one-month period. Data was collected prospectively using a proforma. Information collected included patient demographics, time/date of injury, mechanism, site of fracture, and subsequent management.

Results: Eighty-nine patients with a total of 95 fractures were entered into the study. The mean age was thirty-eight. 75% were under 45. Sixty-four were male and 25 female. Injuries were evenly distributed through the week. The majority occurred between five and 10pm. Most presented within twenty-four hours of injury. Sports injuries (28%) were the most common mechanism, followed by domestic injuries and punch injuries. The majority (64%) involved the dominant hand. The metacarpal was most commonly injured (47%) followed by the proximal phalanx. The little finger was the most commonly injured digit and the index was the least. Overall 37% of fractures required surgical intervention.

Conclusions: Young adult males are the group most at risk and would be an important target for injury prevention strategies. The majority of fractures are managed non-operatively, supervised by our hand therapy department with implications for funding and work force planning. ORIF was the most common fracture fixation used and sufficient equipment and training is needed.

12 **Dislocation of Radial Three Carpo-Metacarpal Joints - A Very Rare Case Presentation and Literature Review**

Dr M K Agrawal, Mr K Patel, Dr C Noor, Mr J Warner, Mr S Hodgson (Bolton)

Introduction: Dislocations of carpometacarpal (CMC) joints are uncommon injuries and are usually associated with high velocity trauma. Multiple CMC joint dislocation commonly involves the ulnar three digits. Simultaneous dislocation of the radial CMC joints is very uncommon and usually associated with fractures. We report a very rare case of simultaneous dislocations of the CMC joints of the thumb and radial two fingers – with emphasis on the mechanism of injury, a review of the literature and management.

Patient and Methods: The study involved a forty-seven-year-old fit and well man, who presented to the Accident and Emergency department following an injury to his right dominant hand. He had fracture dislocation of radial three carpo-metacarpal joints. He was treated with closed reduction and stabilisation with K-wires and immobilisation for six weeks. Post-operatively, progress was monitored by regular follow-up. Regular physiotherapy was commenced after six weeks. He had full function in his right hand at final follow-up.

Discussion: Dislocation of CMC joints usually result from indirect injuries. Dorsal dislocation is much more common than volar dislocation. The required mechanism of injury to produce a dislocation of multiple CMC joints requires significant direct violence across the base of the palm.

In the cases previously reported, patients with multiple CMC joint dislocations had significant other injuries as well. In our case this was an isolated injury. Carpo-metacarpal joint dislocations are easily missed in the A&E. If recognized early, they can be treated and with appropriate physiotherapy the patient can have a good functional result.

REGISTRATION FEES

IMPORTANT NOTICE: Doctors or scientists engaged in research **AND** presenting a paper will not be charged a registration fee for the day they are presenting if they can confirm in writing that they have **no access** to study leave expenses. They must however pay £40.00 to cover the cost of refreshments and luncheon each day they attend the meeting.

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 are as follows and include coffee, luncheon and tea.

| | Registration Fee |
|--|------------------------------------|
| Full / Overseas / Associate Member and Other | £410 Whole meeting £205 One day |
| Trainees (UK only) Companion Members | £230 Whole meeting £115 One day |
| Honorary, Senior Members Speakers who are Research Doctors or Scientists | £ 40 Per day |

REGISTRATION AND ENQUIRY DESK

The Registration and Enquiry Desk, (situated in the Foyer of the Great Hall) will be open at the following times:-

| | |
|----------|-------------------|
| Thursday | 8.30 am – 5.00 pm |
| Friday | 8.30 am – 2.00 pm |

The telephone number of the Registration and Enquiry Desk during the Meeting is:
07930509646 (BSSH mobile telephone number).

HONORARY AND SENIOR MEMBERS

Honorary and Senior Members will not pay a registration fee, but tickets may be purchased for the Society Dinner in the normal manner. A charge of £40.00 will be made for refreshments and luncheon each day.

Applications for ticket(s) should have been made on the registration form.

VENUE OF SCIENTIFIC MEETING

The Scientific Meeting will take place in the Great Hall.

CONTRIBUTORS INFORMATION

Projection Facilities

Projection of presentations will be by Power Point only. The AV will be provided by Joanthan Bailiss at Blaby Audio Visual Ltd. Questions should be addressed to: hire@blabyaudiovisual.co.uk. Presenters were 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.

MEDICAL AND TECHNICAL EXHIBITION

Firms supplying instruments, appliances, materials and books will be exhibiting throughout the two days in the Keith Weller Lounge, 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 Foyer area of the Great Hall.

Authors of posters are asked to 'man' their posters during the second half of lunchtime on Thursday and/or Friday in order to provide opportunity for discussion between delegates and authors. A prize of £250 will be awarded to the best poster.

JOURNAL OF HAND SURGERY PRIZE

A prize consisting of book vouchers up to the value of £500, will be awarded to the presenter of the best paper at the Meeting.

SOCIETY DINNER

Thursday, 1 May at 19.30 for 20.00 hrs
The City Rooms, Hotel Street, Leicester LE1 5AW

The Society Dinner is open to Honorary, Senior and Full Members and Associates, all of whom may invite guests. Lounge suits should be worn. Application for ticket(s) at £55.00 each, should have been made in advance on the online registration form.

TRANSPORT TO AND FROM SOCIETY DINNER

A coach will depart from the Express by Holiday Inn only at 7.00 pm and depart the City Rooms at 11.00 pm. You should have indicated on the registration form if you wish to make use of this facility.

Transport has not been organised from the Holiday Inn or Ramada Hotel.

REFRESHMENTS AND LUNCHESES

Refreshments and luncheon will be served in the foyer of the Great Hall.

BUSINESS MEETING

The meeting, which is open to members and associates only, will be held on Thursday, 1 May at 5.05 pm in the Great Hall.

CAR PARKING

There is ample car parking available at Leicester City Football Club.

HOTELS

All unsold rooms were released on 31 March. Prices listed below cannot be guaranteed at this time

Ramada Leicester Hotel

Rooms available: 30 April and 1 May

73 Granby Street, Leicester, LE1 6ES

£135.00 bed and breakfast, includes service and VAT

£35.00 supplement per night for executive rooms

To book either call direct line – 0116 257 5540 or email: sales.leicester@ramadajarvis.co.uk (Karen or Kirsty)

Group code to quote on booking: 17722481

Car parking available. Hotel is approximately 20 minute walk and 15 minutes drive (one way system) to Football Club. (Walking distance of venue of Society dinner)

Holiday Inn Leicester

Rooms available: 30 April and 1 May

129 St Nicholas Circle, Leicester LE1 5LX

£110.00 bed and breakfast, includes service and VAT

Car parking available. Hotel is 10 minutes walk and 5 minutes drive to Football Club.

To book either call direct line - 0116 242 8708 or email: leicestercity.reservations@ihg.com (Leanne or Sarah)

Group code to quote on booking: AWE

Express by Holiday Inn Walkers Stadium

Rooms available: 30 April and 1 May

Filbert Way, Raw Dykes Road, Leicester, LE2 7FQ

£79.00 bed and continental breakfast, includes service and VAT

To book either call direct line - 0116 249 4590 or email: info@exhileicester.co.uk

Booking reference numbers, arrival date: 30 April - 60058141, 1 May - 60058922.

Car parking available, hotel adjacent to Football Club.

(Coach transfer arranged to Society Dinner on Thursday evening)

FUTURE MEETINGS - 2008

NOTE: There will be no Autumn Meeting in 2008 in London. There will be a combined meeting with the Indian Society for Surgery of the Hand in Bangalore on 27-30 November 2008.

FUTURE MEETINGS – 2009

| | |
|-------------------|--|
| 30 April, 1-2 May | Church House, Westminster, London Combined meeting with American Society for Surgery of the Hand. |
| 12/13 November | Crowne Plaza Hotel, Nottingham |

CONTINUING MEDICAL EDUCATION

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

Thursday: 6.0 Friday: 5.5 Total: 11.5

TRADE EXHIBITORS

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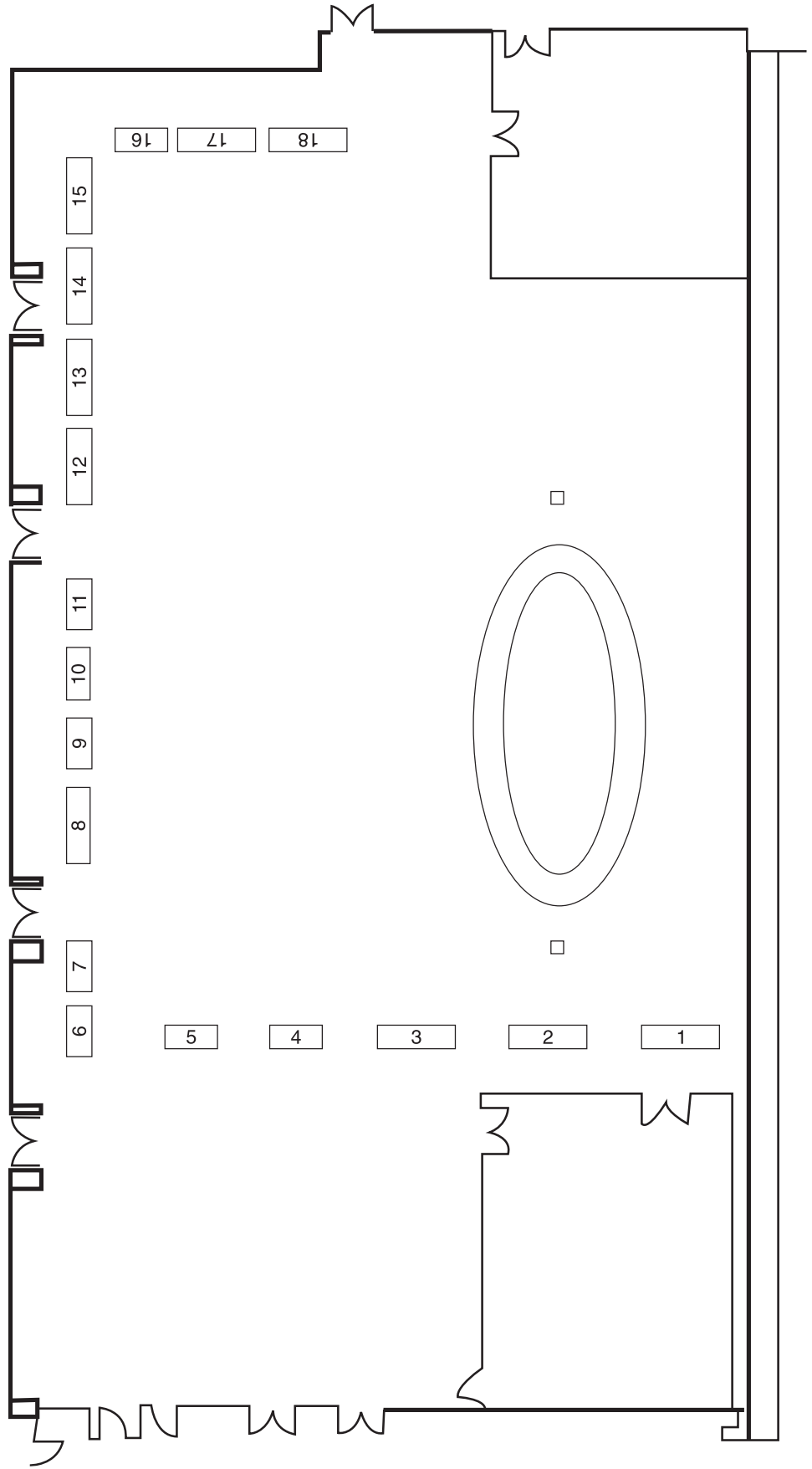
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