BSSH

The British Society for
Surgery of the Hand

SPRING SCIENTIFIC MEETING

30th April & 1st May 2015
Assembly Rooms, Bath

BSSH OFFICERS 2015

V C Lees
President

R H Milner
Immediate Past President

R Eckersley
Vice President

D Warwick
Honorary Secretary

S M Fullilove
Honorary Treasurer

G E B Giddins
Editor in Chief

Council Members
J S Arrowsmith
J P Compson
I Grant
S P Hodgson
D P Newington
D Sammut
G D Smith
M A Waldram

PRESIDENT'S FOREWORD

Dear Members and Guests,

It is a great pleasure to welcome you to the Spring Scientific Meeting in Bath at the elegant Assembly Rooms.

The theme of the conference is 'Innovation in Hand Surgery' with contributions that will build our understanding of how to innovate safely and how to modify our practice for the good of patients. Medicine is currently practiced in a culture that emphasises prevention of poor practice but does not give enough encouragement to new ideas, be they new techniques or new ways of organising the service.

We are delighted to have two international speakers: Professor Joseph Upton from Beth Israel Deaconess Medical Centre, Boston and Professor Scott Levin from Hospital Pennsylvania, University of Pennsylvania who are sharing with us their extensive experience in their respective keynote lectures. Joe Upton is giving his approach to Innovating in Hand Surgery as well as the Scientific Approach to Child's Hand Disorders. Scott Levin is talking to us about Microsurgical Bone Transplantation and about the History of Upper Extremity Salvage using Microsurgical Techniques. I am sure the topics will challenge us to think about how and why we do what we do and to allow us to practice better in future.

Popular formats from previous meetings are back, including the Rapid Fire scientific paper communications that allows us to showcase more of the excellent contributions we have received. There are symposia on radius fracture plating and on tissue engineering that will impact reconstruction of the hand. From the anatomy laboratories of Bristol University we have a video link up with Donald Sammut and Doug Campbell who are demonstrating pulleys, tunnels and biomechanical aspects of hand function following on from the lecture that Donald delivered last year. Another round of 'How I do it' is held to cover commonly performed operations with members of faculty and guests detailing their own tips and pearls of wisdom. Our home grown faculty includes a number of younger consultants who have not had much exposure within BSSH to date but very much represent the future of our specialty.

The Society Dinner on Thursday is held at the spectacular Pump Rooms and we are able to see some of the ancient Roman works that were innovative in their time.

Bath is a beautiful city with many tourist attractions and some excellent restaurants should you choose to come down early or leave a little late.

I look forward to welcoming you whether or not you have previously been to one of our BSSH meetings. We seek to create an exciting programme in a great setting allowing everyone to learn something new that they can take home to enhance their practice.

Viven Lees
President

CONTENTS

OUTLINE PROGRAMME

Thursday 30 April

09:00	Registration and refreshments	
	BALLROOM	CARD ROOM
09:30	Welcome by the President	
09:35	Free paper session	
10:45	Symposium/Debate: To plate or not to Plate - That is the question?	
12:00	Keynote Lecture: Evolution of micorsurgical bone transplantation	
12:30	Lunch and trade exhibitions	
13:30	Keynote Lecture: A scientific approach to disorders of the child's hand	
14:00	Symposium: Innovation	
15:00	Rapid fire session	Special Interest Group for Reconstruction of the Upper Limb in Tetraplegia Meeting
16:00	Refreshments and trade exhibitions	
16:30	Tissue engineering - Prospects for hand surgical practice	
17:30	Business Meeting (open to Members and Associates of the Society only)	
19:15	(for 20:00) Society Dinner - Pump Rooms, Bath	

Friday 1 May

07:30	Registration	
	BALLROOM	CARD ROOM
08:00	Keynote Cadaveric Dissection Anatomy Demonstration: Biomechanics in the hand and carpus	
10:00	Symposium: How I examine the unstable wrist	
10:30	Refreshments and trade exhibitions	
11:00	Rapid fire session	
12:00	Keynote Lecture: Innovation in hand surgery - One surgeon's experience	
12:45	Announcements and presentations	
12:50	Lunch and trade exhibitions	
13:45	Keynote Lecture: History of upper extremity salvage using microsurgical techniques	
14:30	Free papers	SWIFT Investigators' Meeting
15:30	Symposium: How I do it	
16:25	Presentations	
16:30	Close of meeting	

Mr D A Campbell, FRCSEd FRCS(Orth)
Consultant Orthopaedic Surgeon, Leeds General Infirmary
Speaking in: Keynote Cadaveric Dissection Anatomy Demonstration, Friday 08:00hrs / How I do it, Friday 15:30hrs

Mr M A C Craigen, MB FRCS(Orth) FRCSEd EurDiplHandSurg
Consultant Orthopaedic Surgeon, The Royal Orthopaedic Hospital, Birmingham
Speaking in: How I do it, Friday 15:30hrs

Professor T C R Davis, FRCS
Consultant Hand Surgeon, Queens Medical Campus, Nottingham University Hospitals, Nottingham
Tim Davis has been a consultant practising hand surgery in Nottingham since 1991. He was appointed as a Special Professor in Trauma and Orthopaedic Surgery at Nottingham University in 1999 and was Editor of the Journal of Hand Surgery, (European Volume) during 2000-4. He was President of the BSSH in 2009 and is presently chairman of the Society's Research and Audit committee. His particular research interests are distal radius fractures, scaphoid fractures, Dupuytren's disease and osteoarthritis of the trapeziometacarpal joint.
Speaking in: Can surgeons innovate in the current environment?, Thursday 14:00hrs

Professor J J Dias, MD FRCS FRCSEd MBBS
Consultant Orthopaedic Surgeon, Glenfield Hospital, Leicester
Professor Dias is the Professor in Hand and Orthopaedic Surgery and Head of Section of Orthopaedic Surgery at the University of Leicester and works at the University Hospitals of Leicester. His research interests are in epidemiology of hand disorders, Dupuytren's contracture, the outcome of interventions in upper limb and hand trauma and interventions for wrist disorders. He has focused on investigations of effectiveness of interventions for hand and upper limb disorders. He has published over 80 peer-reviewed articles and 25 chapters in books on hand surgery. Professor Dias has received a number of grants from societies and companies, including a grant from the BSSH for a national study on the outcome of Dupuytren's contracture surgery in 2006 and a £2.2 million grant from NIHR HTA in 2013. He was Editor-in-Chief of the Journal of Hand Surgery (European) and a member of the Editorial Board for the Journal of Bone and Joint Surgery. Professor Dias was President of the British Society for Surgery of the Hand (BSSH) in 2008 and is Immediate Past President of the British Orthopaedic Association (BOA). He is a member of several hand and orthopaedic surgery societies internationally, including FESSH, IFSSH and the Indian Society for Surgery of the Hand. He was Head of School of Surgery at the East Midlands Healthcare Workforce Deanery (South).
Speaking in: Can surgeons innovate in the current environment?, Thursday 14:00hrs

Mr N D Downing, MA BMBCh FRCS (Tr&Orth)
Consultant Orthopaedic and Hand Surgeon, Queen's Medical Centre, Nottingham
Nick Downing has been a Consultant Orthopaedic and Hand Surgeon at the Queen's Medical Centre in Nottingham since 2001. His hand surgery fellowship training was in Nottingham, Derby and Sydney, Australia. His practice encompasses all aspects of adult hand, wrist and peripheral nerve surgery.
Speaking in: Symposium/Debate – To plate or not to plate- That is the question, Thursday 10:45hrs

Mr C Heras-Palou, FRCSEd FRCS(Tr&Orth)
Consultant Hand Surgeon, Pulvertaft Hand Centre, Derby Royal Infirmary, Derby
Speaking in: Symposium/Debate – To plate or not to plate- That is the question, Thursday 10:45hrs

Mr J L Hobby, MBBS BSc(Hons) MD FRCS(Tr&Orth)
Consultant Orthopaedic Surgeon, North Hampshire Hospital, Basingstoke
Speaking in: Can surgeons innovate in the current environment? Thursday 14:00hrs / How I examine the unstable wrist, Friday 10:00hrs

Miss A Karantana, FRCS(Orth) , FRCS (Tr&Orth), PGDip (Health Research), Dip Hand Surg, PhD

Associate Research Fellow, University of Nottingham, Nottingham

Alexia Karantana was born and educated in Greece. She came to the UK as an Erasmus fellow with the University of Bristol. This was followed by basic surgical training in Bristol and specialist registrar training on the Mid-Trent orthopaedic rotation. During her registrar training, she completed a PhD with the University of Nottingham. She has trained in hand surgery in Derby, Birmingham and as ATP Hand Surgery fellow in Manchester. Her research interests include outcome of distal radius fractures, clinical trial methodology and economic evaluation.

Speaking in: Symposium/Debate – To plate or not to plate- That is the question, Thursday 10:45hrs

Professor L S Levin, MD FACS

Paul B Magnuson Professor and Chair of the Department of Orthopaedic Surgery, Hospital of the University of Pennsylvania School of Medicine, Philadelphia

L Scott Levin, MD FACS, is the Paul B. Magnuson Professor (with tenure) and Chair of the Department of Orthopaedic Surgery at the Hospital of the University of Pennsylvania School of Medicine, and Professor of Surgery. Professor Levin is Board-certified in Orthopedic Surgery and has a Certificate of added Qualification in hand surgery. In addition, he is Board-certified in Plastic and Reconstructive Surgery.

As an accomplished clinician, his expertise focuses on surgery of the hand and upper extremity, reconstructive microsurgical techniques for extremity reconstruction and limb salvage. His research interests focus predominantly on extremity soft tissue reconstruction and composite tissue allotransplantation.

Working collaboratively with colleagues across medical disciplines, Professor Levin established and was the Director of Duke's Human Tissue Laboratory and also directed the Anatomic Gifts Program. He recently established a Human Tissue Laboratory at Penn which opened in May 2011. The Human Tissue Laboratory acts as a teaching tool and a research facility benefiting students, residents and CME participants. Professor Levin is also the head of the newly formed Penn Hand Transplant Program at Penn and in September 2011, he directed the team that performed a bi-lateral hand and arm transplant. As a committed educator, Professor Levin has been recognized for his commitment to teaching, winning the 2007 Master Clinician/Teacher Award for his accomplishments in both clinical care and education.

Widely published, with more than 247 peer reviewed journal articles, 69+ book chapters and 7 books, Professor Levin also actively participates in senior leadership activities of many international and national professional societies and associations including serving as Chairman of the American College of Surgeons' Advisory Council for Orthopaedic Surgery, REGENTS (ACS), President of the World Society of Reconstructive Microsurgery, past President of the American Society for Reconstructive Microsurgery, member at large of the American Society of Plastic and Reconstructive Surgeons, past President of the American Society for Reconstructive Transplantation and member of the board of directors of the American Board of Plastic Surgery. In addition, Professor Levin has been honoured as a North American Traveling Fellow as well as the American British Canadian Travelling Fellow by the American Orthopedic Association and the Sterling Bunnell Traveling Fellowship by the American Society for Surgery of the Hand. He has served as the Orthopaedic Trauma Association's Landstuhl Scholar, caring for our war injured soldiers in Germany.

Professor Levin is responsible for developing the field of "Orthoplastic Surgery."

Speaking in: Keynote Lecture Evolution of microsurgical bone transplantation, Thursday, 12:00hrs / Keynote Lecture: History of upper extremity salvage using microsurgical techniques, Friday 13:45hrs / How I do it, Friday 15:30hrs

Mr L Muir, FRSCG(Orth)

Consultant Orthopaedic Surgeon, Hope Hospital, Salford

Lindsay Muir is an orthopaedic hand surgeon at Salford Royal Hospital. He graduated in Glasgow and trained in Glasgow and Liverpool before specialising in hand surgery with fellowships in Wrightington, in Strasbourg and with Stewart Watson in Manchester. He is interested in systemic sclerosis and in joint replacement in the fingers. He has the privilege of teaching the Manchester interface hand fellows and derives great satisfaction from this.

Speaking in: How I do it, Friday 15:30hrs

Mr C A Pailthorpe, FRCSEd

Consultant Orthopaedic Surgeon, The Royal Berkshire Hospital, Reading

Speaking in: Symposium Debate – To plate or not to plate: That is the the question, Thursday 10:45hrs

Mr A Reid

Clinical Lecturer in Plastic Surgery, University of Manchester

Adam Reid is a NIHR Clinical Lecturer in Plastic Surgery with a research interest in the surgical treatment of peripheral nerve injury. He undertook his PhD on the mechanism of sensory neuroprotection after nerve injury at the University of Manchester under the supervision of Professor Giorgio Terenghi. He now divides his time between clinical work at the Department of Plastic Surgery at University Hospital of South Manchester and the Blond McIndoe Laboratories, University of Manchester where he is leading research projects on improving nerve regeneration after injury with adipose-derived stem cells and novel bio-engineered conduits.

Speaking in: Tissue Engineering – Prospects for Hand Surgery Practice, Thursday 16:30hrs

Mr D Sammut, FRCS FRCS(Plast)

Consultant Hand Surgeon, Circle Reading and Circle Bath

Donald Sammut is a Consultant Hand Surgeon with a practice shared between Circle Reading and Circle Bath. He is trained in plastic surgery and works exclusively in hand surgery. His particular interests are in nerve and tendon injuries and degeneration, including paralysis and tendon transfers and in reconstruction of the hand. He is a regular lecturer and course organiser in anatomy and hand surgery, in the UK and internationally and is also an established artist. (www.donaldsammut.com)

Speaking in: Keynote Cadaveric Dissection Anatomy Demonstration, Friday 08:00hrs

Dr J Upton, MD

Clinical Professor of Surgery at Harvard Medical School and Director of the Hand Fellowship Program at Beth Israel Deaconess Medical Center, Boston

Dr Upton received his BA from Yale University and his medical degree from Baylor College of Medicine in Houston, Texas in 1970. He completed his surgical residency at Yale-New Haven Hospital in New Haven, Connecticut in 1972, and was an orthopedic surgeon in the US Army stationed at the Eisenhower Medical Center in Augusta, Georgia in 1974. He completed his plastic and reconstructive surgery residency at St Joseph Hospital in Houston, Texas in 1976 and a Fellowship in Hand Surgery at the Roosevelt Hospital in New York, New York in 1977.

Dr Upton's practice is one of the world's largest specialising in congenital hand deformities, vascular anomalies, and paediatric and adult microsurgery. He is on staff at many local hospitals including Children's Hospital Boston, Beth Israel Deaconess Medical Center and Shriners Hospital for Children.

Dr Upton is Clinical Professor of Surgery at Harvard Medical School and Director of the Hand Fellowship Program at Beth Israel Deaconess Medical Center. Among many other works, he is the co-author of the Atlas of Digital Reconstruction: The Ray and Cascade Principle, has edited three books in Hand surgery, has over 200 publications in journals and text books, and has a permanent exhibit at the Boston Museum of Science.

Speaking in: Keynote Lecture: A scientific approach to disorders of the child's hand, Thursday 14:00hrs / Tissue Engineering – Prospects for Hand Surgery Practice, Thursday 16:30hrs / Keynote Lecture: Innovation in Hand Surgery – One surgeon's experience, Friday 12:00hrs

GUEST SPEAKERS

Mr J K F Wong, MBChB MRCSEd HEA PhD

Manchester

Speaking in: Tissue Engineering – Prospects for Hand Surgical Practice, Thursday 16:30hrs

NOTES

09:00 Registration and refreshments

09:30 Welcome by the President

Free Papers
Chairs: Mr R H Milner/Professor D Warwick

09:35 From CT scan to 3D printed model using Open Source software (A dummies guide to file conversion and printing)
Mr B S Goldie (London)

3D printers are becoming affordable for either an individual or for a small department to buy. Although commercial 3D models can be made from a patient's CT scan, this is usually reserved for special cases such as neurosurgical skull reconstruction or planning correction of malunion of bones in the extremity. These models are produced by commercial companies and take a minimum of two weeks to produce and are costly. A distal radius might cost in the region of £250.

Digital Imaging and Communications in Medicine (DICOM) is a standard for handling, storing, printing, and transmitting information in medical imaging (http://en.wikipedia.org/wiki/DICOM). Many PACS software can produce on-screen volume or 3D renditions, but they generally cannot export the volume in the file format required for a 3D printer. STL (STereoLithography) is a file format native to the stereolithography CAD software created by 3D systems. STL is also known as Standard Tessellation Language (http://en.wikipedia.org/wiki/STL_(file_format)).

On searching online, one can find paid-for software with which one can convert DICOM to STL, however the software is costly and not aimed at individual users.

In contrast, 3D Slicer is a free, open source software package for visualisation and image analysis. 3D Slicer is designed to be available on multiple platforms, including Windows, Linux and Mac Os X. It is a very powerful software but part of its capability is that it can be used to create a 3D volume from either a CT or MRI and then the model can be exported in a STL file.

In order to print a STL file it in turn has to be converted by "slicing" software into G-code. G-code is a language in which people tell computerised machine tools how to make something. The "how" is defined by instructions on where to move, how fast to move, and through what path to move. For 3D printing, this software is referred to as slicing software. Cura is open source software developed by Ultimaker that converts .STL into G-code.

Using an Ultimaker2 printer I have made models that have subsequently helped inform patients and plan surgery. I will give examples of some of the prints I have made.

09:40 Discussion

NOTES

09:42 **A single dose Collagenase protocol in sixty-nine patients: An effective and acceptable strategy for palmar Dupuytren's, but is the cost justified?**
Mr J Granville-Chapman, Mr O Templeton-Ward, Ms D Gray, Mrs C Urquhart (Guildford)

Dupuytren's disease is common and incurable. Limited fasciectomy is morbid and expensive: clinic based needle aponeurotomy is effective in the short term but has high recurrence rates. Studies testing Collagenase (Xiapex) are promising for both efficacy and recurrence. A service evaluation of sixty-nine patients was undertaken to determine efficacy, acceptability and cost of a single-dose Collagenase protocol for metacarpophalangeal contracture. Cord separation was carried out on day three and succeeded in 66/69 cords. PROMs improved significantly. Twenty-three of 25 patients with previous treatment experience strongly preferred Collagenase. Sixty-eight would recommend Collagenase and 67 repeat it. Bruising was common and fourteen sustained small skin tears. The protocol was highly acceptable. Our cohort total tariff was £83,587. A single-dose protocol is effective and highly acceptable to patients, but it remains significantly more expensive than needle aponeurotomy: this threatens its enduring viability.

09:47 Discussion

09:49 **A single injection of Collagenase Clostridium Histolyticum for the treatment of moderate Dupuytren's contracture – A two-year follow-up of forty-seven patients**
Mr J McFarlane, Dr A Syed, Ms T Chester, Dr A Talbot-Smith (Hereford)

Patients with Dupuytren's contracture (DC) prefer non-surgical treatments if the results are as good as surgery, as non-surgical treatments generally have a much quicker recovery time. The principle non-surgical techniques are needle aponeurotomy (NA) and Collagenase Clostridium Histolyticum, (CCH) injection, the former becoming less popular because of high recurrence rates and the latter being questioned on grounds of cost-effectiveness.

From a literature search, we defined criteria for which a single injection of CCH was likely to be successful: patients with a single palpable cord, affecting only the metacarpal-phalangeal joint (MCPJ), with a contracture angle of less than 60° (patients with a contracture of less than 30° were not treated). We treated forty-seven consecutive patients with these criteria, using only one injection of CCH per patient, and followed them for two years from intervention. We found a recurrence rate of 25% and a requirement for further treatment of only 2%, which compares favourably with other treatments.

09:54 Discussion

09:56 **Collagenase injection for multiple digit Dupuytren's contracture – An initial study**
Miss A Davy (London)

Introduction: Much of the data published for Collagenase refers to use in a single digit. Patients have routinely requested treatment for multiple digits and natatory cords. This study assessed the outcome and satisfaction in these patients.

BSSH
The British Society for Surgery of the Hand

NOTES

Materials and Methods: Fifty-seven patients with multiple-digit Dupuytren's contracture were prospectively studied. Thirteen of these patients had previously undergone surgery. Pre- and post- procedure contracture was measured, along with DASH, URAM and satisfaction scores. SPSS was used to analyse the results, using the Wilcoxon test.

Results: All patients undergoing treatment for multiple digits had significant improvement in pre-procedure contracture ($P<0.001$). Although there were more complications with bruising and swelling, all symptoms resolved within a few days. There was no difference in the outcome of this study group when compared with patients undergoing single digit injection. Patients who had previously undergone surgery expressed superior satisfaction with this treatment.

Conclusion: Collagenase may be safely used for patients with multiple digit involvement, and frequently patients express increased satisfaction with this treatment when compared with traditional surgery.

10:01 Discussion

10:03 A preliminary study: The use of photography to objectively assess Dupuytren's disease

Dr L Sayed, Professor J J Dias (Leicester)

Introduction: We aim to use photography as a method of objectively assessing the volume of disease and severity of contracture in patients with Dupuytren's disease. The ability to provide a visual record for current analysis of severity of disease will not only aid future assessment of disease progression but also recurrence following intervention. Furthermore, it has applications for research that facilitates monitoring patients at distance.

Material and Methods: Between 2003 and 2013, 1095 patients attended University Hospitals of Leicester for assessment and management of Dupuytren's disease. All patients were sent a pack in the post which gave clear instructions about how to take a photograph of their diseased hand as directed in a study by Smith et al. The images were provided in electronic format or converted to electronic format. Adherence to photography instructions, volume of disease and extent of contracture were analysed. Volume of disease was measured by recording skin dimpling as 1, nodules as 2 and cords as 3 (for each digit). Extent of contracture was assessed by measuring angles of fixed flexion using a program named Image J. A combined score was given for each volume of disease and contracture.

Results: We received and analysed photographs from one hundred and forty-seven patients which gives an initial response rate of 13.4%. Thirty patients were unable to answer (due to health problems), 25 patients were not willing to participate and 28 packs were returned due to incorrect address. 79.6% of the photographs were taken as per instructions, the remaining 20.4% either did not take all views needed for analysis or did not take the photograph from the correct angle. Number of digits involved ranged from 0-9 (mode = 2), volume of disease ranged from 0-15 (mode = 3) and total contracture involvement ranged from 0-549°. Total flexion deformity values for each digit were converted into Tubiana staging system scores. The little finger most frequently had the highest Tubiana score and volume of disease.

Conclusions: Of the patients that responded, a high proportion were able to provide a photograph that was suitable for analysis. When used in combination with functional outcome measure questionnaires, photography and computer software aided estimates of disease volume and contracture make an efficient and reliable method of monitoring patients.

References: Smith BP, Dias JJ, Ullah A, Bhowal B. Visual and computer software-aided estimates of Dupuytren's contractures: correlation with clinical goniometric measurements.

10:08 Discussion

10:10 **Exosomes from adipose-derived stem cells increase neurite outgrowth in vitro**

Miss R Ching, Dr P Kelk, Professor M Wiberg, Dr P Kingham (Umea, Sweden)

Introduction and Aims: Despite advances in nerve surgery, functional recoveries after peripheral nerve injuries remain limited. With the aim of developing new treatment strategies we have examined the effect of adipose-derived stem cell (ASC) secreted factors (sub-cellular exosomes) on neurite outgrowth.

Materials and Methods: Rat ASC was differentiated towards a Schwann cell-like phenotype (dASC) in vitro. Exosomes were prepared from conditioned media taken from the dASC and primary rat Schwann cells (SC) and applied to neurons for twenty-four hours. Neurite outgrowth was measured by computer image analysis. The exosomal contents were investigated using RT-PCR techniques to identify mRNA and microRNA involved in nerve regeneration.

Key Results with Supporting Statistical Analysis: Neurons treated with either dASC or SC-derived exosomes showed longer neurites than the control groups ($p<0.05$, $n = 3$). RNA was identified in both cell type exosomes including GAP43, NF200, peripherin, miR-1, miR-133a and let7d.

Conclusion: dASC exosomes increase neurite outgrowth in vitro, mirroring their SC counterparts. The mRNA and microRNAs identified within these exosomes may play a role in nerve regeneration. Future use of exosomes together with bioengineered nerve conduits for the treatment of peripheral nerve injuries might overcome the current limitations associated with harvesting a functioning nerve for either a graft or SC culture, and also avoid the requirement for transplanting stem cells themselves.

10:15 Discussion

10:17 **Outcomes following distal inter-phalangeal fusion in the hand using Acutrak® screws**

Mr A Malhotra, Mr M Gandhi, Mr R Singh, Mr D Ford, Mr S J Pickard (Oswestry)

Aim: To analyse retrospectively the functional and radiographic outcome of patients undergoing distal interphalangeal joint arthrodesis at our institute.

Materials and Methods: Between 2010 and 2014, forty-six distal interphalangeal joint arthrodesis were carried out in 31 patients at our institution. The case group

consisted of twenty-two females and nine males with an average age of 61 years (50 years to 75 years). Average follow-up was ten months (six months to 31 months). Four patients had concomitant procedures, e.g. lateral band transfer. Indications for surgery were: failure of conservative treatment; severe pain; and diminished thumb and finger function hampering everyday life.

Surgical Technique: Dorsal incision over the joint surface. Preparing the joint to accept the guide wire for a mini/micro Acutrak®. Hand therapist and consultant surgeon follow-up two, six weeks post-operative, after which on an individual basis.

Results: Four (12 fingers) patients underwent the procedure as part of rheumatoid hand reconstruction while 27 (33 fingers) patients required the procedure due to osteoarthritis. There were six thumbs and 39 fingers operated upon. In twenty-five digits the micro Acutrak® screw system was used and in 20 digits the mini Acutrak® screw system. Two digits required re-operation, one for infected non-union and the other for simple non-union. Both the non-unions were in the micro Acutrak® screw. Three cases of superficial wound infection which settled down with antibiotics. Average screw size used 20mm. Clinically 85% rated good, 10% fair and 5% poor results.

Conclusion: Our experience of arthrodesis using the Acutrak® system shows better results if compared to K-wire fixation. However, even within the Acutrak® system better results were noted in the mini Acutrak® group than the micro Acutrak® group. The practice of both the senior authors has now changed to using only the mini system for all their DIPJ arthrodesis.

10:22 Discussion

10:24 War injuries to the upper limb in UK personnel – The pattern of injury

Captain A Johnson, Captain R Staruch, Mr S Hetteriatchy, Colonel A Kay, Mr D Chester (Birmingham/London)

Introduction and Aims: The aim of this work was to review all injuries sustained to UK soldiers in the upper limb.

Material and Methods: A retrospective search of the Joint Theatre Trauma Registry was undertaken. All UK soldiers sustaining injuries to the upper limb were searched. Upper limb injuries from the start of operations in 2003 to the present day were included. A subsequent statistical analysis was undertaken to look at the significance of type of injury and site of injury in the hands. Spearmans rank correlation coefficient, Chi-squared test and Wilcoxian test were used.

Results: 1846 upper limb injuries were sustained by servicemen in Afghanistan since 2003. 1499 injuries were battle related injuries, of which 1339 were due to some form of explosive device. Explosive device was the commonest mechanism of injury overall (63%), and of these the IED caused 69% of injuries. Two hundred and forty-three amputations were found between the shoulder and phalanges. The most common amputation was in the phalanges (51%). Correlation analysis using Spearman's rank identified certain finger sets that were commonly amputated and injured over other groups.

Conclusion(s): This research has statistically identified the pattern of injury from IED in the upper limb from recent operations.

NOTES

10:29 Discussion

10:31 **Variation in treatment of distal radius fractures across England**
Mr E Stirling, Mr N Johnson, Professor J R Thompson, Professor J J Dias (Leicester)

Introduction and Aims: Controversy still exists about the best method for treating distal radius fractures. In this study we investigated whether there is variation in how distal radius fractures are treated across hospital trusts in England.

Material and Methods: Hospital Episode Statistics data from a twelve-month period from April 2010 to March 2011 in England was reviewed. Accuracy of data was checked by comparison with data obtained from theatre books and coding during a corresponding period at our trust. Funnel plots were used to compare data between trusts and magnitude of variation was calculated.

Results: Mean number of total fractures treated per trust was 149 (range 41–375, SD 66.4) with a mean of one hundred fractures treated with internal fixation (range 16–290, SD 48.7). Rate of plate fixation varied from 1.3 to 61.7 patients per 100,000 population between trusts (47-fold variation). When the five trusts with the highest rates and the five trusts with the lowest rates are excluded, the range is 7.4–48.9 per 100,000 population and the variation is 5.5-fold. K-wire fixation varied from 0.2 to 29.9 patients per 100,000 (150-fold variation). When the five trusts with the highest rates and the five trusts with the lowest rates are excluded, the range is 0.6–23.5 per 100,000 population and the variation is 43-fold. Rates of surgical intervention were significantly higher in smaller trusts.

Conclusion: There is wide variation between hospital trusts in the rate of surgical treatment for distal radius fractures. Larger units have a lower rate of fixation while smaller units have high rates of fixation.

10:36 Discussion

10:38 **The minimal clinically important difference of the Patient-rated Wrist Evaluation Score for patients with distal radius fractures: A prospective cohort study**
Miss M Walenkamp, Miss L Vos, Mr R J de Munick Keizer, Dr J C Golsings (Amsterdam)

Introduction: Patient-reported outcomes are important to assess treatment effects. For distal radius fractures, the Patient-rated Wrist Evaluation Score (PRWE) is the preferred measure of outcome. However, in order to appreciate a treatment effect expressed as a change in PRWE score, it is important to be aware of the smallest change that is perceived as meaningful from patients' perspectives. This is also called the minimal clinically important difference (MCID). For patients with distal radius fractures, the MCID of the PRWE is unknown. Therefore the purpose of this study was to determine the MCID of the PRWE score in patients with distal radius fractures.

Methods: We prospectively included one hundred and two patients with a median age of fifty-nine years (interquartile range 48–66). All participants completed the PRWE questionnaire during two separate visits (6–12 weeks after injury and 12–52 weeks after injury). Additionally, patients answered an anchor question to determine the degree of clinical change they appreciated. Accordingly, patients were categorised

NOTES

into two groups: (1) improved; or (2) worsened or no change. We determined the MCID according to the ROC method. In this context, the change in PRWE is considered a diagnostic test and the anchor is the gold standard. The optimal ROC cut-off point reflects the value of the MCID. Additionally, we determined a separate MCID for patients aged ≥65.

Results: The majority of patients indicated to experience marked improvement and the PRWE score between the first and the second measurement differed significantly ($p < 0.001$, Wilcoxon Signed Rank Test). The MCID of the PRWE for all patients was 12.7 points and 15.3 for patients aged ≥65.

Conclusions: A change of 12.7 points on the PRWE represents a clinically important difference for patients with distal radius fractures. Patients sixty-five years and older require a slightly larger difference to experience a meaningful change. We recommend using these values at group-level to interpret treatment effects and as a basis for sample size calculations.

10:43 Discussion

Symposium/Debate
Chair: Mr D J Shewring

10:45 To plate or not to plate – That is the question?
Faculty: Miss A Karantana, Mr C A Pailthorpe, Mr N Downing, Mr C Heras-Palou

Keynote Lecture
Chair: Professor V C Lees

12:00 Evolution of microsurgical bone transplantation
Professor S Levin (Philadelphia)

12:30 Lunch and trade exhibitions

Keynote Lecture
Chair: Miss G Smith

13:30 A scientific approach to disorders of the child's hand
Dr J Upton (Boston)

Plenary Session
Chair: Mr R Eckersley

14:00 Can surgeons innovate in the current environment?
Faculty: Professor T R C Davis, Mr J L Hobby, Professor J J Dias

15:00 Special Interest Group for Reconstruction of the Upper Limb in Tetraplegia Meeting (Card Room)
Chair: Mr D Power

BSSH
The British Society for Surgery of the Hand

Rapid Fire Session (Ballroom)
Chairs: Mr D Brown/Mr J Compson

15:00 The effect of wrist position on grip endurance and grip strength
Dr S Sechachaden, Miss S Lee (Singapore)

Introduction and Aims: While data on the effect of wrist position on grip strength is available, studies on grip endurance are scant even though it holds great practical implications. This study focuses on the effect of wrist position on grip endurance while also confirming previous reports on the optimal position for grip strength.

Materials and Methods: Thirty-eight right-handed individuals participated in this study. Each participant's maximum grip strength (MaxGS) was measured bilaterally at six different wrist positions (unsplinted, 45°, 30° and 15° wrist extension, 0° and 30° wrist flexion). A maximal intermittent endurance test and calculated Fatigue Index (FI) was used to measure grip endurance.

Results: Grip endurance was similar at all wrist positions with no significant difference in FI between the positions, unsplinted or otherwise. When splinted, the MaxGS was significantly reduced in both the dominant and non-dominant hand by 6-43% and 11-43% respectively. The greatest MaxGS occurred at 15° extension, however this was not statistically significantly different from 30° extension. Similarly for the non-dominant hand, the greatest MaxGS occurring at 45° extension was not statistically significantly different from 30° and 15° extension. Statistically significant gender differences for MaxGS concurred with current data. For grip endurance, there was no significant difference between males and females.

Conclusion: There was no particular angle at which wrist endurance was greater. Additionally, the angle at which MaxGS was greatest concurred with current recommendations for wrist fusion. Therefore, wrist fusion at slight dorsiflexion is ideal for grip strength without compromising on grip endurance.

15:03 Discussion

15:05 Management of nail bed lacerations; Is hand clinic follow-up necessary?
Dr S Edler, Miss C Yiannakis, Mr D Thornton (Leeds)

Background: Repair of nail bed lacerations/fingertip injuries represent a significant proportion (11%) of acute hand surgery undertaken in our plastic surgery department. Increasing patient numbers referred from A&E creates pressure on clinic appointments with high proportions of patients not attending, or being discharged at first review. Follow-up arrangements vary between individual surgeons and units leading to varied post-operative regimes.

Aim: We felt that patient expectation could be appropriately managed with an information sheet provided at surgical discharge to reduce requirement for post-operative clinic follow-up whilst maintaining safety.

Methods: A retrospective review of all such cases treated in our department between January and June 2014 was performed. We then substituted routine clinic follow-up with provision of an information sheet on hospital discharge outlining the anticipated recovery, possible prompts for re-presentation and answers to key questions often encountered at follow-up.

NOTES

NOTES

Results: 11% patients were not invited for clinic follow-up beyond dressings review. Of those who were, 51% did not attend and 44% were discharged at first review. Only 6% patients required ongoing care beyond first clinic review.

Conclusion: We present our patient information sheet and comparison of follow-up regimes both originally in clinic and after provision of patient information sheets.

15:08 Discussion

15:10 Fingertip amputation replacement as a composite graft in a paediatric population: Survival and long-term morbidity
Mr L Murugesan, Mr D Butler, Ms J Ruston, Mr A Woollard (London)

Introduction: Limited studies exist on the outcome of replacing an amputated fingertip as a composite graft. We report the outcomes and predictors for composite graft survival along with the long-term morbidity.

Methods: A retrospective medical notes review of all patients under sixteen years who underwent composite graft replacement of an amputated fingertip between October 2006 and April 2013 was performed. Long-term morbidity was evaluated through a standardised parental questionnaire. A Chi-square test was performed with $p<0.05$ considered statistically significant.

Results: One hundred and twenty patients were identified of whom 97 were eligible for inclusion. Parental questionnaires were completed for forty-two (43%) patients. Mean patient age was 4.3 years. Mean follow-up was twenty-seven months. There was a 10% complete and 34% partial graft survival rate. Patients aged four and over were significantly more likely to have complete graft take than those under four (14% versus 3%, $p = 0.04$). Time from injury was not a predictive factor in graft survival, although no grafts completely survived if replaced after ten hours (n=12). 17% required further surgery or developed a post-operative infection, but there was no difference in the complication rate between those with complete/partial/no graft survival. In 67% patients the fingertip was reported as appearing 'abnormal' with 48% patients reporting a hook-nail deformity and 17% reporting cold intolerance. Only 5% of patients reported any functional difficulties long-term.

Conclusion: The rate of complete composite graft survival in a paediatric population is low, with hook nail deformities and cold intolerance common long-term complications. The likelihood of any functional deficit is, however, low.

15:13 Discussion

15:15 Evaluating YouTube as a source of patient information: Treatment options for Dupuytren's disease
Dr M Jones, Mr A Wiberg (Plymouth/Bristol)

Introduction and Aims: The aim of this study was to ascertain the content and educational quality of videos uploaded to YouTube on the topic of Dupuytren's disease.

Method: A total of fifty-five videos were selected and analysed independently by two doctors who assessed the source, content and educational quality of each video.

Key Results: 55% of videos were deemed "useful to patients", with the majority uploaded by medical professionals. Of these, only 27% provided a comprehensive overview of all treatment options. 15% of videos were deemed "misleading", and were more likely to suggest alternative treatments lacking an evidence base. The videos most viewed and "liked" were uploaded by patients/public, and were more likely to be misleading. 35% of videos were deemed to be advertisements by medical practitioners, and the vast majority of these (93%) focused on 'office-based' treatments – needle aponeurotomy and collagenase injections.

Conclusion: Useful patient education videos are available on YouTube but are interspersed between ones that are potentially misleading. There appears to be a disproportionate amount of information focusing on needle aponeurotomy and collagenase injections. Patients should be aware of the source and intent of the video and put preference on viewing those produced by medical professionals.

15:18 Discussion

15:20 The coding of procedures for Dupuytren's contracture

Dr J Sheldrake, Mr F Rayan, Miss M Schreuder (Mansfield)

Introduction: Dupuytren's contracture can be a debilitating disease caused by palmar fibromatosis. Surgical correction is commonly undertaken but there are several procedures that can be performed. Healthcare Resource Group (HRG) codes are derived for each patient episode and form the basis of hospital funding via the current NHS 'Payment by Results' system. Varying procedures generate different HRG codes and thus have a varying 'tariff' attributed to them by non-clinical coders. If an incorrect HRG code is generated, the hospital will be underpaid (or overpaid) for the work it has carried out. We aimed to determine if the HRG codes accurately reflected the procedure which had been performed.

Methods: The tariffs allocated to a six-month sample of 50 patients who underwent procedures for Dupuytren's contracture between October 2012 and October 2013 were obtained from the coding office. Operation notes were reviewed to determine the procedure performed and the tariff discrepancy was calculated. The results were presented to all the surgeons performing these operations locally to highlight the importance of clearly stating the procedure performed in the operation note for use by non-clinical coders. A re-audit of thirty-four patients was then performed between December 2013 and June 2014.

Results: The initial audit revealed a discrepancy of £76,20, a 45% increase on the payment the hospital received. One patient was excluded in the initial audit and one patient in the re-audit due to no operation notes being available for either patient. Re-audit showed a discrepancy of £19,239, which was scaled up to £28,292 to match patient numbers. This was only a 13% increase. The majority of the discrepancy was caused by not coding for digital fasciectomies when both palmar and digital fasciectomies had been performed. The presence of typed notes appeared to make no difference to the coding accuracy.

Discussion: Our study shows the importance of a clear operation note title in ensuring accurate coding and may demonstrate an endemic problem throughout the NHS. A huge financial impact was made by simply increasing awareness amongst clinicians. The importance of coding should be emphasises across all departments and specialities to guard against loss of remuneration.

NOTES

15:23 Discussion

15:25 **Five-year follow up of percutaneous needle fasciotomy: The Peterborough experience**

Miss S Raut, Mr A Durst, Mr A McKee, Mr J Jones (Peterborough)

Introduction and Aims: Percutaneous needle fasciotomy is a safe and efficacious treatment for Dupuytren's disease and can be performed on an outpatient or procedure room basis. Current reported rates for recurrence are 50% at three to five years. The aim of this study, as per NICE guidelines, was to report our outcomes following needle fasciotomy at three to five years and assess whether it is an acceptable alternative procedure for our own practice.

Methods: We evaluated fifty-seven consecutive digits (36 patients) which underwent needle fasciotomies by two hand surgeons using the same technique, between April 2009 and July 2011, at our unit. Patients were initially followed up at ten to 14 days post-operatively for a wound check, followed by hand therapy and splinting for three weeks. They had further in-clinic follow-up consultations at six weeks and three months. Patients received two further follow-ups by telephone, at one year and a minimum of three years. Additional data was collected through reviewing patients' notes. From these consultations and data, assessment was made of patient satisfaction, complications, recurrence and revision/further procedures.

Results: There were no cases of neurovascular or tendon damage. One patient had a superficial wound infection and one had a case of wound maceration, both of which had settled by their second follow-up. No other complications were noted. Upon consultation at one year post-op, twenty-two patients reported that they were happy with the procedure and that their expectations had been met with no complaints. Four of these patients returned for a contralateral procedure, whilst a further four said they would have returned if they had contralateral disease or a recurrence. At three to five years, 18 out of 36 patients (50%) reported a recurrence of their disease. Of these, eleven went on to have a further procedure. This was an open fasciectomy or dermofasciectomy in all cases.

Conclusions: Our results are in line with current reported recurrence rates. As per the guidelines set out by the National Institute for Health and Care Excellence, we have provided a safe service and have successfully audited our local practice. It can be concluded that needle fasciotomy is a safe procedure with good patient satisfaction. It has been shown to save the need for surgery in some patients, whilst delaying it in others.

15:27 Discussion

15:30 **Pre-operative use of botulinum toxin to prepare patients with upper limb spasticity for tendon transfer/lengthening: A case series**

Miss P Gill, Mrs A Henry, Mr Z Hassan, Professor P McArthur (Liverpool)

Introduction: Botulinum toxin (BTNx) is used in upper limb spasticity to interrupt nerve stimulation by preventing the release of acetylcholine. This case series involves the pre-operative use of BTNx before definitive tendon transfer or lengthening in order to optimise movement in patients with severe head injury (SHI) and cerebral palsy (CP).

Methods: Patients were administered BTNx into affected flexors before definitive tendon transfer/lengthening procedures. Following surgery, aggressive hand therapy input was initiated and patients were followed up in OPC.

Results: One senior surgeon performed the BTNx administration and tendon transfer/lengthening procedures at the Burns and Plastic Surgery Unit at Whiston Hospital. Five patients were treated with pre-conditioning BTNx before definitive surgery. Reduced painful spasticity was noted on waking from the GA after the surgical procedure, thus reduced forces across the tendon coaptation. BTNx has been reported to reduce painful spasticity in hips and erector spinae and our case series supports its use in upper limbs.

Case 1: Seventeen-year-old male with CP managed with BTNx in July 2013 to manage right upper arm spasticity. Pre-conditioning performed to FCR, FCU, PT, FDP, FDS and FPL. Definitive surgery October 2014, with right FCU and FPL lengthening, with FCR transfer with good outcome.

Case 2: Sixteen-year-old female with SHI in 2002, resulting in left hemiplegia managed with BTNx. Underwent BTNx to left FCR, PT, FDS, FDP, thenars, adductors and interossei in September 2013. Left wrist FCR transfer to ECRB and lengthening of FDP, FDFS, FPL and FCU uncovered spasticity in intrinsic muscles, which responded to BTNx to left APL and lumbricals.

Case 3: Twenty-year-old female with SHI, resulting in right sided hemiparesis. Managed with BTNx to biceps, FCR and FDS. Underwent right FDS and FPL lengthening, right FCR transfer to ECRL and right 1st carpometacarpal joint fusion with K-wires. Unfortunately the K-wires needed removal due to discomfort and BTNx addressed the overactive thenar muscles. A right thumb osteotomy, release of abductors and volar plate tightening was followed by BTNx to right FPL and thenar muscles in October 2014.

Case 4: Eighteen-year-old female with CP with flexed left wrist. BTNx was administered to left FCR, FDS, FDP and FPL in September 2013, followed by FCR tendon transfer to ECRB and lengthening of FDS and FPL. Good range of movement noted at wrist and able to perform bilateral tasks.

Case 5: Twenty-four year-old male with SHI in 2006, resulting in upper right limb spasticity. Underwent BTNx to right forearm flexors and intrinsics. Underwent tendon transfer right forearm, release of intrinsics, right ECU tenodesis and tendon rebalancing. BTNx was injected to right FCR before right FCR lengthening was performed in February 2013. Post-operative BTNx has improved right wrist position.

Conclusion: Our cases series supports the use of BTNx to pre-condition patients with upper limb spasticity before definitive surgical management. The implications for clinical practice are that a reduction in post-operative pain results in improved splint compliance and earlier instigation of aggressive therapy.

15:33 Discussion

NOTES

BSSH
The British Society for Surgery of the Hand

NOTES

15:35 **Comparison of non-operated patients and those with four-corner fusion for Grade 3 SLAC/SNAC wrist**
Mr H Singh, Professor J J Dias (Leicester)

Four-corner fusion (4CF) for scapholunate advanced collapse (SLAC) and scaphoid nonunion advanced collapse (SNAC) wrist relieves pain and retains function. However we do not know whether this is better than natural history.

We reviewed sixteen patients (ten men, mean age 54 years) who had not had surgery for Grade 3 SLAC and SNAC wrist (non-operated group) and 24 patients (17 men and mean age 49 years) with 4CF (operated group) more than six months after surgery. Patients completed MHQ and PEM questionnaires, had grip strength assessment with MIE dynamometer and range of motion assessment with flexible electrogoniometry. The findings from each group were compared with one hundred normal volunteers (50 men, mean age 46 years). The mean follow-up was forty-three months after onset of symptoms for the non-operated group and 72 months after surgery for 4CF group.

Patient reported outcome scores were better after 4CF, with median MHQ score of 42 (range 13–58) for non-operated cohort compared to 70 (range 18–99) for 4CF group ($p=0.02$). PEM score also improved after surgery (73 for non-operated cohort, 48 after 4CF group, $p<0.01$). However, the range of motion was identical with similar area of circumduction for the non-operated group (1992°°) and for 4CF group (1233°°). This range was nearly 50% of that seen in normal volunteers (4613°°). There was also no difference in grip strength with similar area under the force time curve for the 4CF group (8777N) and non-operated group (7128N). But this was still nearly half the strength seen in normal volunteers (15709N). The patients with SLAC and SNAC wrist could expect improvement in pain and function but may not improve in grip strength and range of motion.

15:38 Discussion

15:40 **Congenital anonychia**
Mr A Qureshi, Mr K Y Wong, Mr I Grant (Cambridge)

Introduction: Congenital anonychia is rare. A search of the literature in the English language identified less than twenty cases. We report a case of congenital anonychia. Apical folds of the ears, a paternal history of congenital absence of one kidney, and a maternal history of congenital cataract were noted.

Case Presentation: A fit and healthy forty-four year-old delivered a 3950g male child via emergency lower Caesarian section at 41 weeks, due to failed induction of labour. The child was noted to have complete absence of nails on differing digits of all four limbs. Examination of the child revealed a fold at the apex of each ear. The parents were unrelated, non-smokers, and had normal hands and feet with normal nails. The pregnancy was unremarkable with no known exposure of the fetus to any teratogen. The patient's father had a congenital absence of one kidney and the patient's mother had a congenital cataract.

Discussion and Conclusion: Nail development occurs between the third and the fifth months of the expected gestational age. Drugs given to the mother in the 1st and 2nd trimester of pregnancy can have a marked impact on nail formation. Congenital hereditary nail anomalies are much rarer than those acquired during life. Mutations

in the RSP04 gene on chromosome 20 have been implicated in abnormal nail development. The distribution of the congenital anonychia in family members strongly support the proposal that mutations in RSP04 on chromosome 20 responsible for anonychia follow an autosomal recessive pattern of inheritance.

15:43 Discussion

15:45 **Is there a need for VTE thromboprophylaxis in hand surgery?**
Dr M S Patel, Miss C Wildin, Professor J J Dias (Leicester)

Introduction: The British Society for Surgery of the Hand (BSSH), in response to the National Institute for Health and Care Excellence (NICE) has recommended guidelines for venous thromboembolism (VTE) prophylaxis in patients undergoing hand surgery.

Aim: We investigated the incidence of recorded VTE events after trauma and elective hand surgery.

Materials and Methods: The 2011/2012 Hospital Episode Statistics (HES) data was searched, linking elective and trauma hand surgery with VTE events for a single hospital episode. The ICD-10 codes for DVT (I-82) and PE (I-26) were linked to the HRG codes for elective hand (HRG – HB51-HB55) and trauma hand (HRG - HA5) surgical procedures.

Results: Of 35,087 trauma hand surgical procedures (HRG HA5), there were no recorded episodes of VTE. Of 131, 824 elective hand surgical procedures, there were 25 VTE episodes (8 DVT and 17 PE). The incidence of VTE following elective and emergency hand surgery is 0.015%. All of the cases of PE had occurred in less complex procedures, including eight after carpal tunnel release, with the remainder after trigger finger release or excision of fascia.

Conclusion: All of the recorded episodes of PE were linked with low complexity surgery, taking less than ninety minutes, and therefore regardless of risk factors would not have had VTE prophylaxis according to existing BSSH guidelines. The duration of surgery does not appear to be a strong implicating factor in the development of a VTE.

15:48 Discussion

15:50 **Management of moderate carpal tunnel syndrome: What is your practice? A preliminary survey**
Miss D Lim, Mr D Ryan, Mr W Mason (Gloucester/Bristol)

Introduction: The aim of our survey is to determine the pattern of management methods for moderate carpal tunnel syndrome (CTS).

Methods: Using Survey Monkey, we asked clinicians and allied health professionals who commonly deal with CTS about their experience, local policies, preferred management, and the effect level 1 evidence might have on their practice.

Key Results: Five hundred and eighteen professionals from a variety of backgrounds responded, with 50% seeing at least 50 cases per year. 58% were aware of the existing NICE summary and 60% were aware of local Clinical Commissioning Group

NOTES

policies. 62% treat based on clinical diagnosis, with no need for nerve conduction studies. For a typical patient with night symptoms, but no permanent numbness or wasting, 43% advocated surgery, with 37% preferring to trial a single steroid injection before surgery. 9% offered patients multiple steroid injections while these provided satisfactory relief. Surgeons were more likely to offer surgery as first-line in comparison to non-surgical practitioners. Failure to relieve symptoms, recurrence and median nerve injury following injection were the main reasons cited for offering surgery only. The majority of respondents felt that a multicentre clinical trial comparing steroid injection and surgery would be warranted, with 60% claiming their practice would change if this showed a benefit in favour of injection (20% of patients not requiring surgery at two years).

Conclusion: Management of moderate CTS varies widely, with the majority of those surveyed preferring surgery to steroid injection. This evidence supports the need for a large clinical trial comparing treatment options, to provide level 1 evidence to support current practices and assess their cost-effectiveness.

15:53 Discussion

15:55 Scaphoid fractures in children and adolescence

Miss E Harrison, Mr G Williams, Mr S Robinson, Mr D Wright (Liverpool)

Introduction and Aims: Scaphoid fractures in children and adolescence present a rare diagnostic challenge, resulting in a lack of studies validating clinical tests in skeletally immature patients.

Material and Methods: Retrospective case note and image analysis of all patients undergoing wrist MRI/CT for suspected acute scaphoid fracture between January 2008 and December 2013. Resulting in seventy-three patients (43 female, 30 male), mean age 12.7 years (range 8-16 years). All patients were examined by higher trauma and orthopaedic trainees around two weeks after injury for clinical signs of scaphoid fracture.

Key results with Supporting Statistical Analysis: Only seventeen fractures were identified on MRI. Demographics and examination findings were tested for associations with scaphoid fracture, using 2x2 contingency table analysis Fishers exact tests. Left sided injury, male gender, higher energy and signs suggestive of scaphoid fracture on radiograph (lucent or sclerotic lines) demonstrated statistically significant associations with scaphoid fracture. Sensitivity/specificity of classical adult examination tests were poor when analysed in isolation for children and adolescents; anatomical snuff box tenderness (64%/32%), scaphoid tubercle tenderness (71%/41%), thumb telescoping (41%/71%). A combination test of either tubercle tenderness or telescope test pain demonstrated 100% sensitivity and 38% specificity for scaphoid fracture.

Conclusions: Our study confirms previously reported associations with scaphoid fracture such as male gender, mechanism of injury and that adult clinical examination signs predictive of scaphoid fracture can be used in combination to guide management and decision making for wrist injuries in children and adolescents.

15:58 Discussion

THURSDAY 30 APRIL
16:00 – 19:15

16:00 Refreshments and trade exhibitions

Tissue Engineering – Prospects for Hand Surgical Practice
Chair: Mr H P Giele

16:30 The future in soft tissue/bony reconstruction
Faculty: Mr J Wong, Mr A Reid, Professor J Upton

17:30 Business Meeting
(Open to Members and Associates of the Society)

19:15 (for 20:00) Society Dinner
Pump Rooms, Bath

NOTES

BSSH
The British Society for Surgery of the Hand

NOTES

07:30 Registration

Keynote: Cadaveric Dissection Anatomy Demonstration
Chair: Mr C Healy

08:00 Biomechanics in the hand and carpus
Demonstrators: Mr D Sammut/Mr D Campbell

Keynote Lecture
Chair: Miss S Fullilove

10:00 How I examine the unstable wrist
Mr C Heras-Palou (Derby)

10:30 Refreshments and trade exhibitions

Rapid Fire Session
Chairs: Mr M A Waldram/Mr J Field

11:00 Paediatric volar plate injuries: Time to discard the splint?
Miss M Baker, Mrs M Downs, Mr S Wilson (London/Bristol)

Background: The management of stable paediatric proximal interphalangeal (PIPJ) volar plate injuries (VPI) varies widely. Traditionally, physiotherapists treat with dorsal blocking splint (DBS) for four to six week followed by range of movement (ROM) exercises.

Methods: We prospectively collected data for six months on patients 16 years or younger, with a stable PIPJ VPI. Exclusions included the thumb, previous injury to digit, grade 3 VPI.

Standardised treatment: Grade 1 VPI - mobilise. Grade 2 VPI - buddy-strapping for ten days then mobilise. All patients were given an advice sheet with ROM exercises and an open appointment. Telephone consultations were made at four and eight weeks post injury.

Results: Forty-seven consecutive patients, mean age 13 years (6-16). Thirteen patients had grade 1 VPI, 34 grade 2 VPI, including 30 middle phalanx avulsion fractures. No patients had concerns at four week follow-up. Four patients with grade 2 VPI and avulsion fractures reported stiffness/flexion contracture at eight weeks, which fully resolved with physiotherapy and dynamic splinting.

Conclusion: Stable isolated paediatric PIPJ grade 1 and 2 VPI can be successfully treated with advice sheet, buddy strapping and ROM exercises without formal DBS. This represents a reduced clinic attendance for patients and their parents with excellent clinical outcomes.

11:03 Discussion

NOTES

11:05 **Thumb CMC arthrodesis – Our institute's experience**
Mr A Malhotra, Mr R Singh, Mr M Gandhi, Mr D Ford, Mr C Kelly, Mr S J Pickard (Oswestry)

Aim: To analyse retrospectively the functional and radiographic outcome of patients undergoing thumb CMC arthrodesis at our institute.

Material and Methods: Between 2010 and 2013, eighty-four thumb carpo-metacarpal joint arthrodesis were performed on 70 patients. The case group consisted of forty-two females and 28 males with an average age of 50 years (20 years to 63 years). Average follow-up was ten months (six months to 22 months). Indications for surgery were: failure of conservative treatment, severe pain, and diminished thumb function hampering everyday life. All patients had radiological evidence of advanced thumb carpo-metcarpal joint arthritis (Eaton and Littler grade II to III).

Surgical Technique: Wagner type incision, blunt dissection sown to the capsule protecting the superficial radial nerve and the superficial radial artery. Prepare the joint surface using a saw. Thin sliver of bone from the proximal end of the metacarpal and corresponding cut along the distal end of trapezium. T plate – compact hand set (AO) used to stabilise the arthrodesis. Patient was put into cast for a period of six weeks. Hand therapist and consultant surgeon follow-up two and six weeks post-operatively, after which on an individual basis.

Results: Patient-rated outcome scores indicated very good pain relief with preservation of grip and pinch strength. There was one case (1.2%) of radiological non-union which did not require revision surgery. In eight patients (9.5%), there was metalwork related pain out of which three (3.6%) required just plate removal and two (2.4%) required trapeziectomy as well. Two (2.4%) patients suffered from superficial wound infection which was treated with antibiotics. There were no cases of a chronic regional pain syndrome. Two patients had scar neuroma while one each had parasthesia of the thumb and a painful neuroma – latter of which required exploration and neurolysis. In no case was there X-ray or symptomatic progression of the disease at scaphotrapezial joint. Clinically, 85% rated good, 10% fair and 5% poor results.

Conclusion: The present form of thumb carpo-metacarpal arthrodesis is reproducible and offers an excellent alternative to trapeziectomy especially in younger patients. We had a re-operation rate of 7% (five patients) and an overall complication rate of 17% (15 patients).

11:08 **Discussion**

11:10 **The use of silastic trapezial replacement following failed trapeziectomy**
Mr D Dickson, Mr S Talwalkar, Professor R Murali, Mr M Hayton, Professor I A Trail (Wigan)

Revision procedures for patients who have undergone a trapeziecotmy are not widely reported in the literature. We report on a series of ten patients who had poor outcome following primary surgery and were subsequently treated using a silicone trapezium replacement.

There were seven women and three men, the mean age was 59 (range 48–74) years, with a mean interval between primary and revision surgery of 19 (range 12–28) months. Review was performed at an average of forty-six (range 18–89) months.

The primary surgery had been with a sling in six and an interposition graft in four. 50% have either undergone or have further surgery planned since the Silastic replacement. The VAS score for pain was six (range 1-10) although six felt that it had at least initially helped their symptoms. Seven of the implants either dislocated or were subluxed. Six patients would undergo the same procedure again. Mean grip and pinch strengths were 68% and 56% respectively compared to the contralateral side. Only one patient had a near normal Quick DASH score of 9 whilst the rest ranged from 25 to 68.

These are a difficult group of patients to manage for which the best answer is unknown. Whilst at least 60% felt they had benefited from surgery most still had significant symptoms, impairment of function with 50% undergoing further surgical intervention.

11:13 Discussion

11:15 Thumb carpometacarpal joint stabilisation in Ehlers-Danlos syndrome – Case report

Ms A Breahna, Dr B Meads (Newcastle, Australia)

Introduction: We report the case of an eighteen-year old patient with thumb carpometacarpal ligament laxity due to Ehlers-Danlos syndrome who was treated with trapezial opening wedge osteotomy combined with volar ligaments reconstruction. Two years post-operatively she is pain free and the thumb carpometacarpal joint is stable.

Material and Methods: An eighteen-year old woman with Ehlers-Danlos syndrome (Beighton score 5) presented to our clinic with recurrent painful dislocations of her left non-dominant thumb carpometacarpal (CMC) joint. Pain and instability prevented her from grasping and pinching. Crepitus and frank dislocation of the CMC joint of her left thumb were present on physical examination. X-rays showed a subluxated CMC joint with a vertical sloping trapezium and normal articular contour.

Key Results: To maintain the movement at the CMC joint and correct the increased trapezial slope we performed an opening wedge osteotomy of the trapezium and reconstruction of the volar ligaments using a slip of the abductor pollicis longus tendon. The trapezial tilt angle improved from 158°pre-operatively to 135° post-operatively (normal: 129±6°). Grip strength increased from 9kgf pre-operatively to 27kgf at two years post-operatively, whilst key pinch strength increased from 2 kgf to 4 kgf. At two years she has a stable and pain free thumb.

Conclusion: Both an abnormal trapezial slope and ligamentous laxity can contribute to the development of arthritis in the thumb CMC joint due to excessive shear forces. The combination of trapezial opening wedge osteotomy with volar ligaments reconstruction allows restoration of both normal anatomy and stability of the carpometacarpal joint.

11:18 Discussion

NOTES

11:20 **Pyrocarbon PIPJ arthroplasty with a minimum of five years follow-up**
Mr D Dickson, Mr S Talwalkar, Professor A Watts, Mr M Hayton, Professor I A Trail (Wigan)

We present our experience with the outcome and complications with the Ascension pyrocarbon PIP joint arthroplasty at a minimum of five-year follow-up. We identified seventy-two patients with a total of 97 joint replacements. The average age at the time of surgery was fifty-seven (range 24-79). Fifty-one patients (71%) were women. The indication was osteoarthritis in forty-three (60%), rheumatoid arthritis in nine (13%), psoriatic arthritis in six (8%) and trauma in 14 (19%). The average follow-up was one hundred and fourteen months (range 63–164). Twenty-two of the 97 digits (23%) had repeat surgery without revision, and 14 (14%) had revision of the prosthesis. There was no significant difference in the pre-operative and post-operative range of motion which was on average 33° (range 0-90). The average QuickDASH and PEM scores were thirty-five and 33 respectively. The average pain score was 1.7 (range 0–8), satisfaction 6.5 (0-10) and appearance 6.6 (0–10). A lucent line was noted around all prosthesis at follow-up.

Pyrocarbon arthroplasty of the PIPJ results in good pain relief, preservation of pre-operative range of motion, high satisfaction and few complications at a minimum of five years.

11:23 **Discussion**

11:25 **Outcomes following delayed primary flexor tendon repair**
Dr A Elfaki, Mr D Morgan Jones, Mr M Khatib, Mr P Gillespie (Cambridge)

Introduction: Injuries to flexor tendons of the hand are common and delay in repair may lead to adhesions, pulley collapse and tendon retraction. This is believed to be associated with worse outcomes, however currently there is limited evidence to support this. We analyse the outcomes following delayed primary flexor tendon repair.

Methods: Delay was defined as a primary flexor tendon repair five days beyond injury. All delayed primary flexor tendon repairs from May 2007 and September 2013 were evaluated. There were thirty-one patients with a total of 43 flexor tendon injuries. Delay from injury to surgery were divided into 5–7, 8–13 and >14days. Total active movement, need for further surgery and rupture rates were recorded for all cases. The cause for the delay to surgery included patient, administrative and resource centered causes.

Results: The median TAMs in patients having surgery at five to seven days (n=30), 8-14 days (n=8) and greater than 15 days (n=5) were 182, 204 and 201 degrees respectively. There was 11% complication rate, with 9% reoperation rate and a 2% rupture rate. No cases of post-operative infection were recorded. Mean follow-up was twenty-six weeks.

Conclusion: With high rates of complication in delayed primary flexor tendon repairs, this study highlights the importance of prompt time to surgery and adds to the limited literature on outcomes for delayed primary repair of tendons, providing information for patient prognosis and evidence for resource planning in the NHS.

11:28 **Discussion**

BSSH
The British Society for Surgery of the Hand

NOTES

11:30 A trend analysis of levels of evidence in hand surgery research

Mr C Cuneen, Mr C Sugue, Mr C Joyce, Professor J Kelly, Mr S Carroll (Dublin)

Introduction: The application of evidence-based medicine (EBM) to the practice of hand surgery has been limited. Production of high-quality research is an integral component of EBM and essential for the global progression of hand surgery. With considerable improvements in the quality of published evidence in both orthopaedic and plastic and reconstructive surgery, it is imperative that evidence in hand surgery research emulates this trend.

Methods: A systematic review was performed on all hand surgery articles published in six journals over a twenty-year period, involving the years 1993, 1998, 2003, 2008, 2013. The journals included *Plastic and Reconstruction Surgery*, *Journal of Plastic, Reconstructive and Aesthetic Surgery*, *Journal of Hand Surgery - European Volume*, *Journal of Hand Surgery - American Volume*, *Journal of Bone & Joint Surgery* and *The Bone & Joint Journal*. Articles were allocated levels of evidence as per Oxford CEMB Levels of Evidence guidelines. The average level of evidence per article, per year was calculated and compared between journals and hand surgery topic. Study type, number of participants and use of statistical analyses were also solicited. Additionally, the methodology of the randomised controlled trials (RCT) was assessed using Jadad scale. Statistical analysis involved chi squares and student t-test, using a two-sided alpha error of 0.05 for statistical significance.

Results: 1221 original hand surgery research articles were included in the final review. Trend analysis demonstrated a significant improvement in the mean level of evidence from 4.26 in 1993 to 3.91 in 2013 ($p<0.001$). High-quality evidence (level I & level II) only accounted for 9.2% of evidence published, with a significant increase over the study period from 4.5% to 12.8% ($p=0.008$). Case series was the most prevalent study type (32.7 %), with carpus (28.4%) and tendons (21.3%) the most researched topics. Quantitative evaluation of the twenty-six published RCT's, using Jadad scale, revealed a progressive improvement in study design from 0.3 in 1998 to 3.33 in 2013.

Conclusion: Hand surgery research has mirrored trends seen in other surgical specialties, with a significant increase in quality of evidence over time. Yet, high-quality evidence still remains rare. Multiple barriers for performing these studies must be assessed, in order to improve quality of evidence.

11:33 Discussion

11:35 Pyrocarbon metacarpophalangeal joint replacements: A service evaluation with minimum of two years follow-up

Mrs E Peck, Professor D Warwick (Southampton)

Objectives: Arthritis of the metacarpophalangeal (MCP) joint can cause significant pain, deformity and loss of finger function. Traditionally, this joint was replaced with a silastic spacer. Stability and durability, particularly in higher demand patients, may compromise the implant. Pyrocarbon implants have been developed with anatomic accuracy and promising material properties, which should provide greater stability and durability. There are few studies on the outcome of these procedures. This study aims to evaluate the pyrocarbon MCP joint replacements carried out in our unit, over a twelve-year period.

Method: A retrospective review was carried out on eighteen patients who had undergone 29 pyrocarbon MCP joint replacements over a 12-year period. Patients were recalled by telephone; satisfaction, pain and quickDASH scores were calculated. The notes were reviewed for complications and range of movement.

Results: Average age was sixty-eight years (26-91 years). Mean follow-up time was five years (two to 12 years). 50% of patients reported a pain score of 0/3 (no pain) in the finger at follow-up. For those patients where full data was available, arc of movement improved from 34° pre-operatively to 57° post-operatively. The mean post-operative QuickDASH score was 16 (0–45). There were three complications: one superficial wound infection, one revision for pain and one revision for fracture. Patient satisfaction was high with 68% of patients completely satisfied and 21% satisfied. 95% of patients reported that they would have the procedure done again.

Conclusion: Our results suggest that pyrocarbon MCP joint implants are a safe and effective implant to use in MCP joint arthritis with high rates of patient satisfaction and low complication rates. Longer term review and larger studies are required to confirm whether these promising results are reliable and durable.

11:38 Discussion

11:40 Thumb metacarpophalangeal joint arthrodesis using headless cannulated screws

Mr M Hachem, Mr J Compson, Mr A Arya (London)

Objectives: To evaluate functional and radiological outcomes following thumb metacarpophalangeal joint arthrodesis using headless cannulated screws.

Methods: A retrospective review of twenty-three patients (25 procedures) who had thumb metacarpophalangeal joint arthrodesis with two parallel headless cannulated screws. Indications for surgery included rheumatoid arthritis (11), osteoarthritis (9), psoriatic arthritis (1), developmental boutonniere deformity (1) and instability (3). Outcomes measures included Patient-Rated Wrist/Hand Evaluation, DASH, grip strength and radiological evaluation.

Results: Patients were followed up for an average of twelve months. All twenty-five thumbs achieved union. One patient had malunion requiring revision surgery and fusion using plate. Another patient had persistent pain despite evidence of union but refused further surgery. Patient-rated outcome scores indicated mild pain and difficulty with certain tasks but overall high satisfaction rate. Slight decrease in tripod pinch and grip strength noted. Two patients (8%) had complications following surgery. One patient had persistent pain which required revision fusion with plate. Another patient required release of extensor tendon.

Conclusions: Thumb MCPJ arthrodesis using headless compression screw is an effective and safe technique. Headless screws compress and hold the bones securely creating ideal conditions for arthrodesis. Based on our results, we recommend this technique for arthrodesis of thumb MCPJ fusion.

11:43 Discussion

NOTES

BSSH
The British Society for Surgery of the Hand

NOTES

11:45 **Surgical simulation flexor tendon repair using Thiel cadavers: A comparison with formalin embalmed cadavers and porcine models**
Miss S Hassan, Dr R Eisma, Mr A Malhas, Professor R Soames, Miss L Harry (Dundee)

Introduction and Aims: The benefits of Thiel soft-fix-embalmed cadavers have been established in the Centre for Anatomy and Human Identification at the University of Dundee. Thiel embalming has the advantage of preserving the cadaver with life-like colour and flexibility. The aim of this study was to compare surgical simulated flexor tendon repair in Thiel-embalmed with formalin-embalmed cadavers and porcine.

Materials and Methods: Nine participants were recruited. Each participant was allocated one finger on a Thiel and formalin cadaver and a pig's trotter. For each model, the participant carried out identical steps for surgical approach, division, subsequent repair and closure in a single digit. Each participant was asked to assess anonymously all three models using a five-point scale. An objective measure of tendon glide was recorded at the end of each procedure. Odour was assessed on a scale of 1 (minimal smell) to 10 (extreme smell).

Key Results: Flexor tendon repair in Thiel cadavers rated consistently higher compared with the formalin and porcine models (mean 37 SD 2, 22 SD 6 and 23 SD 5, respectively). Objective measurement of odour indicated an overall preference for the Thiel cadaver 3, compared with 4 (formalin) and 5 (porcine). Thiel cadavers recorded an average tendon glide of 21 mm SD 5, formalin cadavers 2 mm SD 2 and the porcine model 6 mm SD 2

Conclusion: Reduction in working hours brings with it a need for alternate ways to train tomorrow's surgeons while at the same time protecting patients. Cadaveric workshops offer a real solution, with studies showing the benefits of cadaveric dissection being transferred to real-time surgery. We show that Thiel-embalmed cadavers were preferred in surgical simulation of flexor tendon repair.

11:48 Discussion

11:50 **Arthroscopic thermal capsular shrinkage of the wrist: Ten to fourteen-year follow-up**
Mr D G Hargreaves (Southampton)

Introduction and Aims: A prospective long-term review of patients who have undergone a thermal capsular shrinkage of the wrist for palmar midcarpal instability. The aim of this study was to investigate whether results of this surgery deteriorate over time.

Material and Methods: Fourteen wrists in 12 patients were independently reviewed at more than ten years post primary surgery. Patients were assessed with a structured interview, functional questionnaire (DASH) and clinical examination.

Results: Twelve out of a possible 13 patients returned for review (92% follow-up). Ten out of 14 wrists have minimal symptoms of subjective instability. Twelve out of 14 wrists have objective stability (midcarpal shift test). 78% of wrists continue to have good/excellent function. Three wrists continue to have poor results from other co-morbidities.

Conclusion(s): There is minimal deterioration of results over long-term follow up. This is contrary to the results seen in the shoulder. Post-operative immobilisation seems to be critical to the success of thermal capsular shrinkage.

11:53 Discussion

Keynote Lecture
Chair: Professor V C Lees

12:00 Innovation in hand surgery – One surgeon's experience
Dr J Upton (Boston)

12:45 Announcement and Presentation
MSc in Hand Surgery (Mr D J Brown)

12:50 Lunch and trade exhibitions

Keynote Lecture
Chair: Mr J S Watson

13:45 History of upper extremity salvage using microsurgical techniques
Professor S Levin (Philadelphia)

14:30 Swift Investigators' Meeting (Card Room)
Chair: Professor J J Dias

Free Papers (Ballroom)
Chairs: Miss J S Arrowsmith/Mr A M Clarke

14:30 Scaphoid fracture nonunion: A systematic review of surgical treatment
Mr D Ferguson, Mr V Shanbhag, Ms H Whalley, Ms I Reichert (Nottingham/Monmouth/Coventry/London)

Introduction: This systematic review assesses the quality and reported outcomes of published articles concerning bonegraft surgery for scaphoid fracture nonunion.

Method: Searches of the CENTRAL, MEDLINE, EMBASE, CINAHL and AMED databases using broad search terms ("Scaphoid" in 'Title AND Abstract' with 'NO LIMITS') captured 2710 articles. Each paper was screened by title, abstract and keywords for suitability and 144 met our inclusion criteria. Data regarding source, study design, population, intervention, comparator (if present) and outcomes (PICO) were extracted.

Results: There were 5464 scaphoid nonunion outcomes within the 144 studies which were mainly case series. Only seventeen studies clearly described their definition of union. Thirty-four and 69 studies reported the outcome of treatment with vascularised bonegraft, and non-vascularised bonegrafts respectively. Cases with avascular necrosis (AVN) of the scaphoid proximal pole were analysed separately. Mean reported union rates for vascularised and non-vascularised bonegraft were 84% (range 27–100%) and 80% (range 17–100%) respectively, but there was wide variation in the reported union rates. Avascular necrosis was diagnosed in several ways and, when present, the vascularised bonegraft union rate was 74% compared to 62% with non-vascularised bonegraft.

NOTES

BSSH
The British Society for Surgery of the Hand

NOTES

Conclusion: Reported union rates vary considerably. These differences may be due to patient factors, fracture factors, treatment factors or study design failures or bias. We recommend that future researchers take into account the deficiencies of previous studies and use the suggested minimum data set in future studies.

14:35 Discussion

14:37 **Scaphotrapeziotrapezoidal joint osteoarthritis: A systematic review of surgical treatment**

Miss V Deans, Mr Z Naqui, Mr L Muir (Manchester)

Scaphotrapeziotrapezoidal (STT) osteoarthritis (OA) is a significant problem, and its management remains controversial. This systematic review aims to review the evidence for surgical interventions specific to STT OA.

Medline and Embase libraries were searched using a pre-defined search strategy in October 2014. All study designs were included and evaluated by the reviewer (VMD) against the inclusion/exclusion criteria. The study eligibility criteria included papers discussing surgical treatment of STT OA.

Two hundred and ninety-six unique results were identified from the search strategy after duplicates were filtered. Twenty-one articles met the eligibility criteria.

Trapezial excision and partial trapezoidal excision is an effective treatment with low morbidity and complications. Distal scaphoid excision remains an effective pain relief treatment that is technically less demanding than arthrodesis, but is contraindicated if there is either scapholunocapitate pathology or midcarpal instability. STT joint fusion is a useful option in the presence of midcarpal instability, but has a higher complication rate.

14:42 Discussion

14:44 **Radiation exposure to the face and eyes during hand trauma surgery – Should we be worried?**

Dr E J Reay, Miss R Morrell, Mr J Auyeung (Durham)

Background: Exposure to ionising radiation during hand trauma surgery is routine and surgeons are familiar with current methods of radiation protection which involve wearing lead gowns and lead neck protectors. Radiation protection guidelines outline the maximum radiation exposure expected over a surgeon's career to limit the risk of radiation induced morbidity. The International Commission on Radiological Protection recently lowered their recommended yearly radiation dose limit for the eyes to 20mSv.

Aim: We aim to quantify the dose of radiation experienced to the face and eyes during hand trauma surgery using the mini C arm. Secondly we aim to assess the difference if any, in the exposure to the operating surgeon using the conventional II machine versus the mini C arm equipment.

Materials and Methods: Radiation detection strips (dosimeters) were worn by the operating surgeon during all trauma cases using the image intensifier (II) and mini C arm over a period of three months. The radiation detection strip was attached to the operating surgeon's surgical hat at the side of the head closest to the radiation source.

The following parameters were recorded at the end of each case: total radiation dose, screening time and imaging type used.

Results: Total radiation exposure to the face and eyes of the operating surgeon during the three month period was 1.8mSv with the mini C arm and 3.3mSv with the II. This translates into a yearly dose to the eyes and face of 7.2 mSv for the mini C arm and 13.2mSv for the standard image intensifier.

Conclusion: The dose of radiation experienced by a hand surgeon to their face and eyes has yet to be documented. Although our work suggests using the mini C arm significantly reduces radiation exposure to the face it still does not reduce it to zero. We would still recommend the routine use of radiation protection glasses.

14:49 Discussion

14:51 From battlefield to Birmingham: The management of complex combat upper limb injuries in a civilian setting

Mr D Roberts, Mr D Power, Mr M Foster, Mr D Chester, Mr R Jose, Mr M Craigen, Professor S Stapley (Birmingham)

In response to the defence review following the first Iraq war, which was short-lived with minimal ground casualties, military medical capabilities were centralised into a single hospital, at the Royal Centre for Defence Medicine, Birmingham in 2003. This model had not been tested in modern times and at inception the volume and complexity of casualties received from the second Iraq and Afghanistan wars were not envisaged.

Since the start of the Afghanistan war there have been 7,351 field hospital admissions, with the vast majority evacuated back to the UK via Aeromed facilities, and 613 seriously injured personnel. Considering upper limb trauma over a ten-year period from May 2004-2014, 1,963 injuries in 1,081 UK soldiers were treated from Iraq and Afghanistan. At the height of the Afghanistan war over a twelve-month period in 2009-10, 233 soldiers with upper limb trauma were seen, a considerable number of whom having multiple, complex injuries.

There have been many lessons learnt from our experience of managing these soldiers and their injuries. Upper limb and associated injuries often require combined specialty input using techniques of both traditional and modern methods of surgical intervention. Early factors on the battlefield and in the field hospital have been influential in both, life and limb salvage as well as expeditious repatriation and a coordinated approach to ongoing resuscitation and reconstruction. The acute stay is followed by a period at the Defence Military Rehabilitation Centre, Headley Court, with critically timed readmissions for secondary reconstruction.

The challenges of dealing with such severe injuries in a civilian setting will be illustrated through a timeline from a series of complex upper limb surgical procedures.

14:56 Discussion

NOTES

14:58 Clinical outcomes for scaphoid fractures in children and adolescents at a specialist children's hospital

Miss E Harrison, Mr G Williams, Mr S Robinson, Mr D Wright (Liverpool)

Introduction and Aims: Scaphoid fractures in children and adolescent patients are rare with a relative lack of studies describing treatment pathways and clinical outcomes.

Material and Methods: Retrospective case note and image analysis for all patients with MRI diagnosed scaphoid fracture between January 2008 and December 2013. Case notes were scrutinised for date of injury, type and time of immobilisation and time to discharge. Our study group comprised five female and 12 male patients with undisplaced scaphoid fractures (11 distal pole, five waist and one scaphoid tubercle fracture), mean age of 12.7 years (range 8-16 years). All patients were referred to the fracture clinic from our emergency department or local walk in centre with normal radiographs and suspected scaphoid fracture. Patients were initially immobilised in either wrist splint or plaster backslab and seen within two weeks of injury. Subsequent clinical examination and radiography were inconclusive prompting use of MRI to establish diagnosis. Immobilisation was continued until patients were discharged with clinical and radiographic evidence of bone healing.

Key Results with Supporting Statistical Analysis: Mean time from injury to discharge was 11.9 weeks (range 3-37 weeks). Types of initial or definitive immobilisation (splints versus plaster) were not associated with adverse outcomes or prolonged follow-up. All fractures healed and patients were discharged asymptomatic or with minor symptoms unsuitable for further surgical treatment.

Conclusions: We found that with early appropriate splinting undisplaced scaphoid fractures in children and adolescents heal in a predictable fashion regardless of immobilisation type. The majority can be discharged asymptomatic within three months of injury.

15:03 Discussion

15:05 Suprafascial ulnar artery propeller perforator flap for hand salvage, with improved donor site versus Becker flap

Mr T Reekie, Miss C Lim, Dr Q Fogg, Professor A Hart (Glasgow)

Introduction: Many options exist to resurface the hand. Certain cases require a local flap with acceptable donor site to cover large/complex defects. PIA and Becker flap utility is limited by poor donor site, inflexibility, or thickness. A refined Becker flap is presented.

Methods:

1. Becker flaps raised from ink/latex injected genoline fixed cadavers (n=7, Caucasian), and cleared to visualise the perforator/intraflap vascular anatomy. Flap technique then refined to raise an equivalent skin paddle as a suprafascial propeller perforator flap.
2. Prospective case series in which free flaps were contraindicated due to hypercoagulability and sepsis (n=2 hand salvage: severe Meningococcal/Group A Strep septicaemia) or life-threatening co-morbidity (n=1 polytrauma); or when this flap was an optimal choice (n=1 hypothenar sarcoma, pedicled; n=1 palmar contracture release, supramicrosurgical free flap). Complex cases.

Results: The perforator commonly has a proximal extension enabling a long flap to be raised (dimensions ≤6x20cm). Intraflap anatomy and clinical outcomes confirm fascia to be unnecessary and thinning safe. Turbocharging options exist, but were not used. Very pliable flap. Reconstructive aims achieved (5/5). Partial necrosis (1/5, iatrogenic cause). Surgical technique refined. No donor site pain/instability; cosmesis good.

Conclusions: Anatomically driven surgical refinement enabled improved use of the Becker donor site, without raising fascia. Donor morbidity was improved, flaps were more supple and compliant for complex 3D insets; viability appears unaffected. All recipient vessels preserved for secondary free flap/hand transplantation.

15:10 Discussion

15:12 Two-stage consent implementation for hand trauma services

Miss S J Edmondson, Mr B Miranda, Mr N Toft (London)

Introduction and Aims: For consent to be valid it should be a two stage process allowing patients the opportunity to make a more informed decision, improve their understanding of their surgery and thus improve engagement with post-operative care, leading to improved patient outcomes. In the hand trauma services at our unit we audited our practices to determine validity of our consenting processes and patient and doctor satisfaction with the services.

Material and Methods: To determine the appropriateness of our consenting processes we established and classified the risks of hand trauma operations into categories: general, sensory, functional, fractures and fingertip injuries. We then audited a random selection of patients over a two-week period (N=25), assessing their notes and consent forms against our criteria. We found potential risks and complications quoted vastly lacked consistency. We then implemented a new hand trauma clerking proforma and re-audited the process one month later (N=30).

Key Results: Following re-audit, all patient notes now had documentation of risks discussed at two stages. Improvements were seen throughout the consenting process. Prior to the new proforma nearly 100% pf people were told about infection, bleeding, scarring, however only 50% were told about nerve, vessel, tendon damage and pain. Sensory and functional risks were discussed in less than 50% of cases. Hand fracture cases failed to mention delayed union and mal union and the risk of metal work was quoted in only 80% and 60% of cases respectively. Following implementation of our proforma, re-audit showed 100% of hand fractures cases now had appropriate risks discussed. Pain, nerve, vessel and tendon damage were noted in almost 90% of cases. Sensory risks were now discussed in more than 80%.

A combination of ten surgeons, nurses and clinic managers were asked to grade and score the new proforma. Following analysis of the numerical comparison with Paired T test, a statistically significant improvement was seen ($p < 0.0001$), with the old proforma scores ranging from 3.6–5.3 and the new proforma scores ranging from 8.0–8.6. The narrower confidence interval with the new proforma also suggested less variation in opinions. From a patient perspective improvement in satisfaction with the process of consenting in the hand trauma clinic was also seen.

Conclusions: Our audit illustrates that with our new proforma, hand trauma patients are being consented in a consistent manner, with an easy way of providing evidence

NOTES

BSSH
The British Society for Surgery of the Hand

of informed two stage consent. Discussion of important risks are therefore less likely to be missed. This overall leads to improved patient care, and concurrent increased patient and doctor satisfaction with the process.

15:17 Discussion

15:19 An algorithm for the management of patients with upper limb spasticity
Miss P Gill, Mrs A Henry, Mr Z Hassan, Professor P McArthur (Liverpool)

Introduction: Traditionally patients with upper limb spasticity are managed by paediatricians, neurologists and medical physicians, using physiotherapy and splintage as mainstay treatment. Once conservative measures are no longer adequate, patients are referred to plastic surgery hand surgeons for consideration of treatment with botulinum toxin +/- surgical interventions. Over the last ten years we have managed upper limb spasticity in this patient group through a combination of botulinum toxin and surgical interventions. We put forward our experience in managing patients presenting with increased tone, fixed contraction or a combination of both, in the form of an algorithm.

Method: Following diagnosis of upper limb spasticity, patients should be managed under an upper limb spasticity multidisciplinary team (MDT) setting involving hand surgeons, occupational therapists, physiotherapists, neurologists, medical physicians and paediatricians. For the purpose of fulfilling the abstract format criteria the algorithm has been shown in a stepwise pathway below. It will be presented in the form of an illustrative and informative diagram in the presentation.

Pathway:

1. Initial diagnosis of upper limb spasticity leading to referral to specialist upper limb spasticity MDT.
2. Specialist upper limb spasticity MDT assessment.
3. Classification into group with increased upper limb tone, fixed upper limb contraction or combination of both.
4. Group with increased upper limb tone is managed with botulinum toxin +/- splintage with regular physiotherapy follow-up.
5. Group with fixed contraction is managed with either serial casting or surgical interventions. Surgical interventions can include tendon transfer, tendon lengthening or skeletal surgery with carpectomy and fusion.
6. Group with combination of increased one in one group of muscles and fixed contraction in a separate group of muscles is managed with a combination of botulinum toxin, splintage +/- surgical intervention.

Following initiation of treatment, there is simultaneous re-assessment by the specialist upper limb spasticity MDT and the cycle continues.

Results: Cases will be presented using photographs and videos to illustrate the journey from diagnosis to treatment for each group in the algorithm.

Increased Upper Limb Tone Group: History of bilateral dystonic cerebral palsy, resulting in level two gross motor function. Underwent multiple injections with botulinum toxin 2012-2013 to bilateral FCR, FCU, PT FDS, 1st web space, thenar and ADM. Has shown significant improvement in range of movement and is under review for possible further treatment with botulinum toxin.

Fixed Contraction Group: History of left spastic hemiplegia following trauma as a child, with level 1 gross motor function. Underwent left pronator quadratus and FDS release, capsulotomy (volar transverse release) and tendon transfer of PL and FCR to ECRB/ECRL/ECU in 2011. Has improved range of motion and function.

Combination Group: History of right spastic hemiplegia with level 1 gross motor function. Underwent injection of botulinum toxin to right FCR, FCU, PT, FDS, FDP and FPL in September 2014, followed by right FCU and FPL lengthening and tendon transfer of FCR to ECRL. Currently undergoing physiotherapy treatment and improving range of motion.

Conclusion: It is important that patients with upper limb spasticity are managed within an MDT setting to prevent delays in referral for surgical interventions, as resulting joint stiffness reduces possible surgical options. We offer an algorithm based on our experience at our unit to manage patients with upper limb spasticity from initial presentation to long-term follow-up, including transition from paediatric care to adult care.

15:24 Discussion

How I Do It
Chair: Mr S L Knight

15:30 Harvest of medial femoral condyle bone flap for scaphoid non-union
Professor S Levin

Radius malunion correction
Mr D Campbell

Trapeziectomy
Mr Linsay Muir

Diagnostic Wrist Arthroscopy
Mr M Craigen

Discussion / Questions

16:30 Close of meeting

NOTES

BSSH
The British Society for Surgery of the Hand

NOTES

1 Control systems in upper limb prosthetics: The state of the field and future directions in 2015

Mr J Rodrigues, Mr G Becker, Mr B Serack, Mr M Christopher (Tucson)

Background: Recent advances in materials, concepts, and production techniques have led to substantial improvement in the functionality of upper limb prostheses. Despite this, end user satisfaction remains low, with prosthetic users reporting considerable difficulty performing complex tasks, even with the most cutting edge products. However, technological advancement in this field continues to occur at a rapid pace. Targeted muscle reinnervation, direct cortical control, and integration with peripheral nervous tissue are all control paradigms that may ultimately lead to dramatic breakthroughs in prosthetic functionality.

Objectives: To summarise and explain the significance of recent advances in the production and capabilities of upper limb prosthetics.

Methods: A comprehensive literature review with discussion of the significant technological advancements in the field.

Conclusions: Refinements of myoelectric control systems have allowed for rapid advances in available devices, while the promise of neural and PNS interfaces gives researchers an ethereal goal to chase. Improvements in materials and manufacturing methods will allow for lighter, durable, and more economically feasible prosthetics. Meanwhile, advancement in neural integration involving both motor and sensory modalities will eventually allow for the production of limbs that may be physiologically and psychologically fully integrated within a patient's life.

2 A surgical point of technique: Use of a cancellous screw to aid single piece excision in proximal row carpectomy

Dr L Y Yong, Miss P Rust (Livingston)

Introduction: Proximal row carpectomy is a motion sparing procedure indicated for degenerative or post traumatic arthritis of the wrist. Current practice involves breaking down of the bones followed by piecemeal removal. We propose an alternative surgical technique to allow removal of each bone whole.

Method: The proximal row carpal bone is exposed via a dorsal wrist approach. A 4mm partially threaded cancellous screw of 40mm length is inserted into the lunate, scaphoid and triquetrum in turn, leaving the unthreaded part proud of the bone. Sharp dissection is carried out and the bone removed in its entirety with the aid of 'joysticking' and traction manoeuvres. Articular cartilage of the bone adjacent can be protected with an elevator. The capsule and extensor retinaculum is closed in turn.

Each bone can be excised whole using this technique which we believe is quicker and more consistent than piecemeal excision. We are not aware of any direct complications with this technique, however very soft bone could cause the screw to cut out of the carpal bone being excised. The cost of a single partially threaded cancellous screw is also comparatively inexpensive in our institution.

Conclusion: Piecemeal removal of the bones creates a risk of remnants being left behind which may result in persistent symptoms as well as a risk of injury to the volar capsule or radio-carpal ligaments. We believe this method reduces the risks and is a

safe and reproducible method for excising the proximal row carpal bones in a single piece.

3 **Management of human bites at Leeds General Teaching Hospital: Action needed!**

Dr J Stallard, Dr S Edler, Mr D Wilks, Mr R Pinder (Leeds/Hull)

Introduction: Reports have highlighted the poor management of patients sustaining human bites. The Health Protection Agency issued guidance in 2012. An audit was performed to assess adherence to guidance by staff managing human bites in the hand unit at the Leeds General Infirmary. This audit revealed that urgent action was required! In response, a local protocol was written and implemented with education of relevant staff with vast improvements in practice.

Aim: Assess standards of the management of human bites against HPA guidance.

1. Improve the overall management of blood born viral risks

Method: The notes of all patients attending the Plastic Surgery Department at LGI between March 2013 and December 2013 with a human bite where analysed. A local protocol was developed based on the results and all staff involved was educated on correct management. A repeat audit was carried out between June 2014 and December 2014.

Results:

	Primary audit	Repeat audit
Number of cases	16	21
Correct bacterial risk management	100%	100%
Documentation of viral risk	0%	83%
Hepatitis B vaccination programme initiated	0%	78%
Banking of blood sample	0%	45%
Correct onward referral	0%	70%

Conclusion: There have been great improvements in the management of patients' blood borne viral risk. We would encourage other units to implement a protocol and hope to do this by presenting the salient features of the guidance. We would advocate continued education amongst junior staff, given their high turnover through the unit.

4 **Is it safe to use a tourniquet in patients with sickle cell haemaglobinopathy? A literature review**

Dr J Stallard, Mr R Pinder (Wakefield/Hull)

Introduction: It is estimated that sickle cell disease affects one in 2,400 live births in England. Tourniquets are regularly used during upper limb surgery to produce a bloodless field, but their use in patients with sickle cell haemoglobinopathies is frequently disputed. We performed a literature review using Medline and Ovid. Eight studies met the search criteria of: tourniquet and sickle cell disease or sickle cell trait.

It would appear that a tourniquet can be used with relative safety in patients with sickle cell disease, providing they have adequate peri-operative management. The findings of the review along with recommendations for surgeons in the safe use of tourniquets in patients will be discussed.

NOTES

5 PIPJ reconstruction with a homodigitial osteochondral graft after simultaneous proximal and distal interphalangeal joint injuries - Case report

Miss S Eltoum Elamin, Mr J Henderson (Bristol)

Intra-articular fractures of the base of the middle phalanx with destruction and compression of the articular surface (pilon fractures) are challenging injuries for surgeons and patients. Ideal management would achieve stability and joint congruency and allow early mobilisation. Various treatments have been described, including closed or open reduction, internal or external fixation, and cancellous or osteochondral bone grafts. Good results have been obtained using hemihamate grafts.

We describe a case of simultaneous DIPJ and PIPJ pilon fractures of the same digit where the proximal end of the middle phalanx was reconstructed using an osteochondral resurfacing arthroplasty graft harvested from the base of the distal phalanx, with fusion of the DIPJ. At eight weeks the patient was pain free with a 90° arc of movement at the PIPJ.

6 A case report of double jeopardy: Two episodes of forearm compartment syndrome in the same patient

Mr R Vijayan, Mr R Seth, Mr A Khandwala (East Grinstead)

Introduction: Compartment syndrome is an important clinical diagnosis, as delay in its identification and management can be catastrophic. Raised pressure within an osteofascial compartment can prevent muscle perfusion and lead to muscle necrosis if releasing fasciotomies are not performed urgently. We are usually familiar with compartment syndrome in the context of significant trauma, with or without bone injury. Unusually in this case, the trauma involved was seemingly trivial, yet in the context of an anti-coagulated patient with convincing symptoms and signs, operative exploration is obligatory and potentially limb saving. Further development of compartment syndrome in the same patient is even more unusual, but underscores the high index of suspicion clinicians must have with anti-coagulated patients.

Case Report: A fifty-five year-old lady taking warfarin for previous DVTs, presented with an acutely swollen and painful forearm after forcefully contracting her forearm flexor compartment while using a car hand brake and later an axe. Compartment syndrome was diagnosed and emergency fasciotomies performed, with a haematoma discovered between the flexor compartments of FDS and FDP. After evacuation and resolution of symptoms, the wounds were closed four days later. Following discharge home on the fifth day, symptoms recurred without warning, prompting re-exploration and discovery of further haematoma. Symptoms again resolved and in due course a skin graft was applied to close the wound without tension.

Conclusions:

- Therapeutic anticoagulation greatly increases the chance of bleeding related events, which can occur after minimal trauma or even apparently spontaneously.
- Be vigilant after closing fasciotomy wounds for recurrent signs of compartment syndrome. When discharging the patient home, ensure that they are fully informed, and know how to quickly access the surgical team if concerned.
- Trust your clinical judgement. If the clinical examination is convincing for compartment syndrome, yet the history seems atypical, it is safest to perform potentially limb saving fasciotomies or seek someone who can.

- Be open to the possibility that a problem may recur even after it has seemingly definitively been treated. If unsure, go back to first principles and consider what the safest course of action is: in this case, to re-explore the wounds.

7 Integrating hand clinics with independent prosthetists – The Mayo Clinic and LimbLab™ experience

Mr J Rodrigues, Mr B Sampson, Mr D Telljohn, Dr A Bishop, Dr A Shin (Rochester)

Background: Recent change to commissioning of UK NHS health care, including the introduction of the Any Qualified Provider scheme, has the potential to increase patient choice. However, the involvement of providers from outwith the NHS has raised some concerns. This work examines the successful collaboration between a hand surgery service with locally-based independent third party prosthetists. The possible clinical benefits of establishing working relationships like this in NHS hand surgery are explored.

Methods: The Mayo Clinic in Rochester, Minnesota, USA, provides a comprehensive integrated adult hand surgery service, comprising orthopaedic and plastic surgeons. LimbLab is a Minnesota-based boutique provider of prosthetics solutions. The two services have established a local collaboration. This presentation reviews their areas of collaboration in upper limb surgery, illustrated with a case series of examples.

Results: Areas of close collaboration between the services include identifying bespoke prosthetic solutions for upper limb amputees, a targeted muscle reinnervation (TMR) service that integrates peripheral nerve surgical strategy with myoelectric prosthesis provision, and functional bracing for brachial plexus injury patients. The latter has the potential to bring adjustments to surgical management based on the prosthetics support available from LimbLab.

Conclusions: This successful collaboration is continuing to develop. By interacting closely with local providers of allied health care services like this, NHS hand surgery centres may be able to further optimise clinical outcomes in challenging areas of practice.

8 Spontaneous flexor tendon rupture in the palm

Mr A Patel, Mr K Y Wong (Cambridge)

Introduction: Spontaneous flexor intratendinous ruptures occur in the absence of underlying pathological processes or direct trauma. They are rare and incompletely understood. We present a case of spontaneous flexor digitorum profundus (FDP) tendon rupture in zone III of the index finger and review the literature.

Case Presentation: A sixty-three year-old male presented with an inability to flex his dominant index finger distal interphalangeal joint following a "snap" feeling he felt whilst putting on his shoes. He was a non-smoker and there was no history of previous trauma to the hand or systemic disease. On examination he had no palpable mass or tenderness along his flexor sheath. X-ray showed no bony abnormality. Four days post injury, he underwent surgical exploration. Flexor digitorum superficialis was intact and he had ruptured his index finger FDP in zone III. The tendon was normal on gross examination and repaired primarily.

NOTES

BSSH
The British Society for Surgery of the Hand

NOTES

Discussion and Conclusion: Closed flexor tendon ruptures usually occur at their bony insertion and most commonly in the ring finger. True spontaneous tendon ruptures in the hand are rare and to date, there have been forty-eight reported cases. The aetiology of these ruptures is likely multifactorial and suggested factors include repetitive trauma, tendon anomalies and vascular alterations. In the absence of avulsion fractures on X-ray, we recommend that all patients with closed flexor tendon injuries should have pre-operative ultrasound or magnetic resonance imaging to determine the site of rupture. This would facilitate pre-operative planning and reduce surgical morbidity associated with unnecessary surgical incisions and dissection.

9 Evaluation of a microsurgery skills workshop for nurses

Dr S Sechachalam, Dr M Satku (Singapore)

Introduction: Two microsurgery skills workshops for nurses were held in our hospital in 2013. These workshops were directed at operating theatre nurses, who in their daily course of work would be required to assist in microsurgical cases. To our knowledge, no such course has been evaluated in medical literature.

Materials and Methods: Each four-hour course consisted of two lectures and two practical sessions, including microsurgical suture practice on a glove and end-to-end anastomosis of a vessel. The courses were evaluated using a twenty-question survey, using a five-point Likert scale for responses. The questions were designed to determine the changes in knowledge, attitudes and practices of the nurses as a result of attending the course.

Results: A total of twenty nurses attended the workshops. We achieved a response rate of 95%. All respondents reported an increase in knowledge of microsurgical skills, instruments, sutures and the use of the microscope. 95% of respondents reported that the course made it easier for them to assist microsurgery cases. 79% reported better tolerance of long microsurgical cases. All respondents reported that they would recommend the course to their colleagues.

Conclusion: Overall, the nurses had a positive view of the course. We will use the evaluation to improve future editions of the course. Other institutions may consider conducting similar courses for their nurses, in view of the positive response from our participants. The next steps would be to validate a questionnaire, which can be used to evaluate similar courses in the future.

10 A case series of fractures of hamate body fractures treated with open reduction, internal fixation

Mr U Edmond, Mr A McMurthie, Mr R Singh, Miss K Lewis (Wrexham)

Introduction and Aims: Fractures of the hamate are rare injuries. Fractures can involve either the hook or the body of the hamate, the former of which are more common. We report a series of patients undergoing operative fixation for fractures of the body of the hamate treated in a single district general hospital.

Materials and Methods: We identified eight patients undergoing operative fixation of the body of the hamate over a period of nine years at our district general hospital. Their operative records and radiological studies were reviewed retrospectively.

Key Results: Only five patients had CT scans performed for operative planning. Seven patients underwent open reduction, internal fixation with lag screws (three

patients with 2.3 mm Leibinger screws and four patients with Acutrak screws) and one patient had K-wire fixation due to the amount of fracture comminution. Plain radiographs performed at an average of 455 days post-operatively (minimum 25 days, maximum 2530 days) showed no evidence of metalwork failure, loosening or non-union.

Conclusion: Hamate body fractures are rare injuries and operative treatment with open reduction internal fixation with lag screws is a viable option with good radiological results.

11 **Corrective osteotomies for malunited distal radius fractures: A novel technique with the application of two plates**

Mr O Akilapa, Mr K Kanuppaiah, Mr J Compson (London)

Background: Corrective osteotomy for malunited distal radius fractures is an established but challenging treatment strategy. Controversies revolve around the best technical approach to restore radial inclination, volar tilt and stability of the distal radioulnar joint.

Methods: We evaluated thirty-five patients treated in a tertiary hand referral unit between 2005 and 2011 with extra-articular distal radial malunion who were managed with corrective osteotomy and were followed up for an average of one year. Each patient was managed with a radial opening-wedge osteotomy and interpositional iliac bone graft. The osteotomy was performed with two volar plates applied in staged manner to facilitate maintenance of the tentative alignments in the sagittal and coronal planes. The patients were evaluated on the basis of objective radiographic measurements and functional outcomes as determined on the basis of clinical examination, including range of wrist motion, strength, and functional capacity.

Results: The mean duration of follow-up was twelve months (range 6–23 months). Post-operative volar tilt and ulnar variance improved significantly compared with the pre-operative status ($p<0.05$). Radiological union was confirmed in the vast majority of patients at an average of three months. The patients reported significant relief of pre-operative pain as well as an improvement in the wrist and range of motion and strength. No intra-operative complications were noted.

Conclusion: We describe an easily reproducible, controlled method of corrective osteotomy for malunited distal radial fractures. This approach has achieved consistent correction of volar tilt, radial inclination and ulnar variance with no significant complications.

12 **An audit into junior doctors' understanding of clinical hand anatomy**

Dr L Watson, Dr C Uzoho, Miss E Katsarma (London)

Introduction: Anatomical knowledge is a fundamental requirement for the effective management of hand trauma and pathology. Modernisation of medical curricula has shifted emphasis away from traditional components like anatomy. Poor anatomical understanding is said to be contributing towards poor clinical outcomes and increasing litigation rates.

Aims: Test junior doctors' knowledge of hand anatomy, assess the effectiveness of anatomical teaching sessions and understand the 'junior doctor perspective'.

NOTES

Methods: This audit was conducted at Chelsea and Westminster Hospital in February 2014. Thirty-eight participants completed a quiz before (Q1) and after (Q2) a 15-minute teaching session on clinical hand anatomy. Standards were defined by consultants in the Hand and Wrist Unit. Statistical analysis was performed using a paired t test.

Results: Q2 scores were significantly higher than Q1 scores for medical students (M=11.4, SD=2.6 versus M=5.9, SD=2.1, p=0.0005), FY1 doctors (M=11.8, SD=3.1 versus M=4.9, SD=1.4, p<0.0001) and FY2 doctors (M= 13.8, SD= 2.8 versus M= 5.5, SD= 2.2, p<0.0001). Subjective knowledge and referral scores also improved significantly. 97% participants felt that further anatomy teaching would improve their clinical practice.

Conclusions: Our study highlights a lack of anatomical understanding amongst junior doctors. We recommend the restoration of anatomy as a central component of undergraduate training and the introduction of clinical anatomy teaching at foundation level.

13 Outcome of pyrocarbon arthroplasty for posttraumatic arthritis of proximal interphalangeal joint

Miss A Lupu, Mr A Desay, Mr D Mackay (Carlisle)

Aim: To evaluate the clinical and radiological outcome of patients who underwent pyrolytic carbon proximal interphalangeal joint (PIPJ) replacement for posttraumatic arthritis.

Methods: Five PIPJ pyrocarbon replacements in five patients (three female and two male, average age 40) were performed, with an average follow-up period of 3.5 years, in patients who had sustained intra articular PIPJ fractures and developed posttraumatic arthritis at a minimum of one year after the injury. The clinical outcome was assessed by range of motion (ROM), DASH, Likert and visual analogue pain score (VAS). Subsidence and migration was assessed radiologically.

Results: VAS significantly improved from pre (Avg 8) to post-operative status (Avg 3) (p=<0.05). There was no statistically significant change in range of movement post-operatively (p=0.45). However DASH and Likert score did not show any statistically significant improvement. Only 40% of patients had improved quality of life at the final follow-up. None recommended the procedure. Average subsidence was 0.5mm for the entire cohort with no cases of radiological loosening. One case underwent revision and amputation for persistent stiffness. Two cases underwent fusion for persistent pain and stiffness. There were no cases of deep infection.

Conclusions: Outcomes in all patients who underwent PIPJ pyrocarbon replacement for posttraumatic arthritis were disappointing. Although there was significant pain relief, ROM was unchanged, patients did not experience improved quality of life, and none recommended the procedure. Hence, we no longer use and do not recommend pyrocarbon PIPJ replacement in posttraumatic cases.

14 Relative metacarpal length

Mr J Stanton, Mr J Karuppaiah (London)

Knowledge of metacarpal length is important in both trauma and reconstructive surgery. There are variations in metacarpal length and length ratios depending on

BSSH
The British Society for Surgery of the Hand

age, gender and ethnicity. Most previous work has involved measurements on anthropological specimens.

Our investigation was designed to investigate the relative lengths of metacarpals. We aimed to produce ratios that would enable accurate calculation of metacarpal length in the face of acute trauma or residual deformity.

We identified one hundred patients from the picture archiving and communication system (PACS), collecting demographic data. We investigated inter observer reliability for measuring metacarpal length and calculated relative ratios.

We present our findings as a useful adjunct to operative planning for surgeons involved with hand trauma and deformity.

15 A novel technique for fixation of proximal pole scaphoid non-union

Mr H Cottam, Miss J Bovis, Mr A Tavakkolizadeh, Mr J Compson (London)

Fractures of the proximal scaphoid pole account for 10-20% of scaphoid fractures and show a high incidence of non-union and avascular necrosis. Several operative fixation techniques have been described. We report a novel technique used to address non-union of proximal pole scaphoid fractures in forty-one patients over a ten-year period. Bone union was achieved in over 75% of patients, although three patients were lost to follow-up. 86% of patients reported good or excellent function.

The technique involves making a transverse dorsal incision over the radius along the radio-carpal junction. The retinaculum is split in line with its fibres. Access to the radio-carpal joint is achieved through the second or the third extensor compartment. The use of a modified Mayo approach preserves the ligamentous attachment to the scaphoid. A window is created initially at the proximal end of the dorsal ridge. The fracture is reduced and fixed with an appropriate length Herbert screw. The fracture site is curetted through this window and cancellous bone graft from the distal radius is packed into the fracture site. The capsule and extensor retinaculum is then closed in layers.

Fixation through the proximal end allows accurate reduction and fixation through the fractured proximal fragment. With the creation of a window in the dorsal ridge, graft is packed into the fracture site and articular surface congruity is maintained. We believe that any fixation method used should aim to maintain congruity of the articular surface with minimal disruption to the capsular attachments. Our technique is tendon sparing, capsule retaining, and ensures maintenance of articular surface congruity.

16 Washing our hands of the problem of patients' dirty hands

Mr R Vijayan, Mr D Nikkah, Mr A Blackburn (East Grinstead)

Introduction and Aims: Over a century and a half since Ignaz Semmelweis' epiphany that hand washing was the key to reducing mortality in obstetric patients, surgeons today demand scrupulous standards of hygiene of their hands, even before donning sterile gloves. Yet in the trauma setting, meagre applications of surgical prep to patients' often filthy hands invariably pass as adequate. Traumatic injuries frequently involve industrial or agricultural equipment, in manual workers with habitually soiled and rough hands. We sought to investigate if this incongruity in standards and attention is reflected in the literature.

NOTES

Materials and Methods: A formal MEDLINE literature search examining terms concerned with pre-operative hand disinfection in hand surgery.

Key Results: Fifty-eight relevant results were found. While much consideration has been afforded to the technique, duration and cleaning solutions of hand disinfection, the vast majority of research focuses on surgeons' hands. A recent review relating to hand surgery omitted the patient's hand entirely in the aetiology of surgical site infections1.

Conclusions: Prophylactic antibiotics ought not to be a substitute for adequate pre-operative patient preparation, particularly in light of emerging antibiotic resistance. We suggest that the balance of cleanliness is brought closer to parity by routinely conducting a preliminary scrub of trauma patients' hands using a bowl of diluted antiseptic solution and a scrubbing brush, as routinely performed prior to burn surgery. The surgical site is then prepared in the usual fashion. Such an approach is likely to do more for the reduction in operative site infections than focusing yet more attention on surgeons' own hands.

References: 1. Katz DI, Watson JT. Surgical Hand antisepsis for the hand surgeon. Journal of hand surgery.2011;36(10):1706-1707

17 Case report of EPL rupture following Lister's tubercle approach for flexible nailing of a forearm fracture in an eleven-year-old girl

Miss N Fine, Mr T Voller, Mr R Poulter (Truro)

Diaphyseal fractures of the forearm make up 5.4% of all fractures in children in the UK. Flexible nailing is thought to be a safe and effective method of treating these fractures if surgery is required. Two options are available for the placement of the radial nail: laterally with associated risk to the superficial radial nerve or the recent technique of dorsally, next to Lister's tubercle.

We present the case of an eleven-year-old girl who sustained a fractured radius and ulna following a fall onto an outstretched hand.

She sustained a midshaft ulna fracture and a radial fracture at the junction of the proximal and middle thirds. The injury was treated with flexible nails. The radial nail was placed via an incision over Lister's tubercle and did not require the fracture site to be opened. The ulna nail was placed from the olecranon and did require the fracture site to be opened.

Six weeks after her operation all wounds were healed and she had been out of plaster two weeks. At this point the patient noticed she had no active extension of the thumb and it appeared as if she had ruptured her extensor pollicis longus tendon (EPL).

Seven weeks after her original operation she underwent an exploration of EPL at Lister's tubercle, which revealed that the tendon had been crushed between the protruding end of the flexible nail and the distal radius. This occurred as the wrist was palmar flexed at the time of insertion and then subsequently brought into neutral for casting.

Two months after and EIP to EPL tendon transfer she has full power in the thumb with no associated movement of the index finger and is back to all normal activities including sport.

This case demonstrates the risk of using the Lister's tubercle approach for flexible nailing if the tendon cannot be directly visualised.

18 Psudotumour secondary to metallosis following total wrist arthroplasty - Case Report

Dr R Taha, Mr J Roushdi, Mr P Stott, Mr C Williams (Brighton)

A fifty-four year old male underwent total wrist replacement in February 2008 for psoriatic arthropathy. Six years following the index procedure he presented with a six-month history of persistent swelling to the radial aspect of his wrist and intermittent pain. There was no history of injury or trauma.

Radiological imaging showed a large, lucent lesion on the radial aspect of the distal radius with associated soft tissue swelling. The prosthesis remained in a satisfactory position. MRI confirmed an expansile mass in the distal radius with a thick rim of enhancement on post-contrast images. An USS guided aspiration was carried out. Histology showed a core of fibrinous material with focal deposition of pigmented histiocytes contained in metallic debris. Foreign body giant cell reaction was seen with no evidence of inflammation or neoplasia confiming the diagnosis of psudotumour.

He underwent revision left wrist arthroplasty. At revision surgery the radial component was well fixed with a large bone defect, the carpal component was loose and the polyethylene liner had failed resulting in an articulation between the two metallic surfaces causing the metal debris. The pseudotumour was resected back to healthy tissue, the bone defect grafted with Bioset putty (Hospital Innovations) and the carpal component revised.

At most recent follow-up he has a good range of motion at the wrist with no evidence of recurrence.

Imaging and intraperative photographs are presented.

19 Use of digital photography and mobile device application to assess finger deformity in Dupuytren's disease

Mr D Gheorghiu, Mr V Bhalaik, Dr N Mheta (Wirral)

Introduction and Aim: The traditional method of measuring contracture deformity at the MCP, PIP and DIP joints is the use of a goniometer. The aims of this study were to assess whether goniometric assessments of deformity correlated well with the assessment of deformity with a mobile device application and digital photography.

Methods: Informed consent was obtained to photograph eighteen patients with Dupuytren's contracture in clinic. Only single joint deformities were measured in this study. The deformity was measured initially using a goniometer by an orthopaedic surgeon and by the hand physiotherapist and subsequently reassessed using the "my measures pro" application on the mobile device.

Results: Seven PIPJ and 11 MCPJ deformities were measured on nine right little fingers and nine left little fingers. There was no significant statistical difference between measurement on the mobile device and the goniometer (p=0.12 95% CI -32.7–3.77). However, clinical significant was that nine of 18 deformity assessments with the mobile device application over-calculated the deformity by at least by 15°.

NOTES

Conclusion: Although there is no correlation between finger deformities on mobile devices and goniometric measurements the use of digital photography is useful to monitor progression of disease and is a useful tool for patient education.

20 **Four-year experience of scaphoid excision and four corner fusion with the Medartis Aptus plating system**

Ms M Spiteri, Mr T Choudhry, Mr M Craigen, Mr D Power, Mr M Brewster (Birmingham)

Aim: Scaphoid excision and four corner fusion is a motion preserving salvage procedure for degenerative carpal conditions. This series reviews its clinical and functional outcomes using the Medartis Aptus Four-Corner Fusion plate at a tertiary hand centre. This multidirectional angular stable plating system offers an alternative to K-wire, staple, screw and plate fixation.

Methods: Patient records and radiological imaging were reviewed since this implant was first used at our institution in May 2010. Indications for surgery, patient co-morbidities and complications were noted. Outcome measures were time to union, range of motion, grip strength and DASH score at final clinic review.

Results: Between May 2010 and June 2014, twenty such cases were performed. Mean patient age was fifty years. Sixteen patients underwent surgery for SLAC and SNAC wrists. Radiographic scapholunate and carpal alignment was restored in all cases. There were three cases of non-union, with a mean follow-up of nine months in cases of union. No cases of removal of metalwork of plate impingement. Range of motion varied with a mean flexion-extension arc of 63°, grip strength of 24kg, and DASH score at union between 12–48.

Conclusions: This plate has good clinical and functional results with a high patient treatment satisfaction rate. Non-union can still occur despite this plate allowing the use of cortical and multidirectional locking screws to achieve carpal compression besides conferring angular stability.

21 **Successful treatment of chronic de Quervain's tenosynovitis with micro fat grafting: A case series presentation**

Miss H Creasy, Mr C Bain, Mr M James (London)

De Quervain's syndrome is a common condition causing radial wrist pain due to entrapment of abductor pollicis longus and extensor pollicis brevis in the first extensor compartment. Various conservative management options exist depending on the severity of symptoms, ranging from life style modifications, splinting and steroid injections. Surgical intervention in the form of decompression of the compartment is widely described for those cases that remain symptomatic despite conservative treatment.

We present six cases of recalcitrant de Quervain's that had undergone multiple steroid injections, two of which had previously undergone decompression. These cases were treated with primary, or re-release, of the compartment in combination with micro fat grafting and platelet rich plasma injection. We utilised a local donor site at either the elbow fat pad or medial knee.

We present good early data of significant improvement in symptoms in five out of six cases, utilising the VAS score at a mean follow-up time of three months. This novel

technique provides restoration of contour to the atropic skin fascial envelope, with the addition of stem cells with the aim of improving tendon gliding.

22 **Spontaneous rupture of FDP to the right index finger associated with ten-year FPL rupture left untreated, secondary to DISI deformity after scaphoid non-union - A case report**

Dr A Chandra, Mr P Mikalef, Professor M Gupta, Mr S Tan (Birmingham)

Spontaneous intratendinous closed flexor tendon ruptures are reported to be rare. It has been associated with arthritis and is more common in zone III and usually involves the ulnar FDPs of the little and ring fingers. Attrition ruptures can occur over sharp bony prominences in the carpal tunnel, such as the hamate hook and pisiform that can abrade ulnar sided tendons. The scaphoid and lunate can form abrasive surfaces that can cause fraying to the flexor tendons.

We present a seventy-six year-old male patient who presented after a low impact injury to his hand followed by forceful flexion of the fingers two days later. He described a snapping sensation following which he could not flex the terminal phalanx of his index finger. Interestingly he had a similar episode of snapping ten years ago after which he lost the ability to flex the terminal phalanx of his thumb on the same hand. X-ray of the wrist showed a non-union of a proximal scaphoid fracture with DISI deformity, but the patient had nearly full range of movement, no pain and no recollection of any wrist injury. Exploration of the carpal tunnel showed that there were sharp bony prominences at the ununited fracture site of the scaphoid and the lunate that were protruding at the carpal tunnel. This had caused attrition rupture of the FPL, about ten years ago, and the FDP to the index finger that ruptured more recently. About 20% of the FDS to the index finger was also frayed.

The rationale of the definite treatment, the patient's expectations and the clinical result are described. There is only one similar case reported in the literature but there was spontaneous rupture of both FPL and FDP to index simultaneously mimicking anterior interosseous nerve palsy. Spontaneous ruptures of the flexor tendons are difficult problems and treatment should be individualised. Delayed attrition ruptures of the flexor tendons present as one of the long-term complications of scaphoid non-unions and subsequent DISI deformity.

23 **Collagenase injection's clinic model is the way forward: Prospective cohort at a University teaching hospital (clinical and financial analysis)**

Mr M Ibrahim, Dr K Aretaki, Miss E Taylor, Miss A Davy (London)

Introduction and Objectives: Dupuytren's contracture (DC) is a disabling condition. Different treatment modalities are available ranging from needle fasciotomy to dermofasciectomy. Collagenase injection (Xiapex®) has opened a new era in the treatment of DC. Current economic climate requires every single step to reduce expenses. This study illustrates the effect of introducing Xiapex® clinic at a teaching hospital.

Methods: This is a prospective study conducted between August 2013 and November 2014. Institutional approval for the study was obtained. Data was analysed using SPSS software version 17. The primary outcome measure was fixed flexion deformity at MCPJ, PIPJ and DIPJ. Student t test was used to compare parametric data and Wilcoxon Signed Ranks test was used to compare non-parametric data. The cost of other treatment modalities was compared one year before and after starting Xiapex® using NHS tariff costs.

NOTES

Results: One hundred and two fingers in 67 patients were treated with Xiapex® during the study period through 16 designated Xiapex clinics. The average age of this cohort was sixty-four (34 – 82). Average (mean (SD)) pre-operative MCPJ, PIPJ and DIPJ Fixed Flexion Deformity were 31 (27), 34 (28), 0(6) degrees, this was significantly improved at MCPJ and PIPJ to 7 (14) and 17 (24) ($p<0.001$). Forty-two patients were operated on in the year just before the start of Xiapex with a total cost of £197,210. Twenty-one cases were operated on in the first year of starting Xiapex with a total cost of £99,965, which is almost half the cost of the first year. The total cost of ninety Xiapex injections performed in one year was £72,990.

Conclusion: Dedicated Xiapex® clinic is the way forward to reduce cost and increase the volume of treated patients in the NHS with significant improvement in the degree of deformity. The increase in the number of the patients treated will help to reduce DC waiting time in the NHS.

24 A collaborative issue – Dupuytren's practice across the United Kingdom

Dr E K Reay, Mr R Trickett, Mr M Jones, Miss A Barnard (Newcastle upon Tyne/ Nottingham/Sheffield/Leeds)

Background: The management of Dupuytren's disease has evolved over the last ten years to include a number of different treatment options. These treatment modalities range from non-operative enzymatic fasciotomy to open fasciectomy and dermofasciectomy. The choice of treatment varies according to geographic location between centres and surgeon preference in centres.

Aim: We aim to utilise the advanced training fellowship research collaborative, set up in 2013, to audit current practice in the treatment of Dupuytren's disease across the United Kingdom.

Methods: Six centres were involved in collecting data on their current management of Dupuytren's disease. One hundred consecutive cases of Dupuytren's disease were audited in each centre and the management method recorded. The six centres divided their management broadly into limited fasciectomy, dermofasciectomy, needle fasciotomy and enzymatic fasciotomy.

Results: All centres reported that limited fasciectomy remained the most commonly performed surgical procedure for the treatment of Dupuytren's disease. Four centres used needle fasciotomy in their treatment arsenal. Retrieving data on the number of needle fasciotomies was very difficult however, as they were often performed in the outpatient setting. Four of the six centres utilised collagenase as a treatment for Dupuytren's disease.

Conclusions: Collagenase as a treatment for Dupuytren's disease is common across the UK although limited fasciectomy remains the most commonly performed procedure. Needle fasciotomies were also performed in the majority of centres but the number will be underestimated due to the difficulty with data collection. We found that inaccuracies in data collection techniques and coding methods for Dupuytren's disease may represent a significant loss of revenue for Trusts.

NOTES

25 The untold story about "good-bacteria" in your yoghurt pot

Mr M Pywell, Mr J Ibanez (London)

Introduction and Aims: To review the literature surrounding microbiology of necrotising fasciitis and present the first ever documented case of necrotising fasciitis caused by Lactobacillus, present in the hand.

Material and Methods: A literature review was performed surrounding the microbiology of necrotising fasciitis and other infections associated with Lactobacillus. Our unique case was reviewed with clinical, microbiological and operative findings.

Key Results: A review of current literature shows that 61% of patients with necrotising fasciitis have a single causative organism, no organisms are present in 26% and multiple organisms are identified in 17% of cases. The most common organism was identified to be Group A Streptococcus (12.1%) followed by MRSA (11.3%) and MSSA (10.4%). Lactobacilli are gram-positive facultively anaerobic bacteria present in the gastro-intestinal tract and vaginal canal in humans and in animal saliva. Due to their ability to convert sugars to lactic acid and provide an acidic environment they are widely used as pro-biotics and their anti-inflammatory effect has been thoroughly researched. Lactobacilli have been shown to reduce the duration of illnesses, the risk of developing antibiotic associated diarrhoea and the cytotoxicity of group A Streptococcus, a common organism responsible for necrotising fasciitis. However, Lactobacilli are also associated with dental infections and endocarditis and have been shown to be responsible for 4% of dog bite infections and one case of Fournier's gangrene. Our case is a forty-four year-old, right-handed lady who presented with an abscess over the proximal phalanx of her right little finger and hypothenar eminence. She had knocked her hand whilst cleaning five days previously and noticed increasing swelling and erythema. There was circumferential swelling and blistering to the base of the right little finger extending dorsally over her hand, with erythema extending proximally to the dorsal wrist crease. The patient was septic and intravenous Clarithromycin was started, due to a penicillin allergy. At initial debridement subcutaneous pus was identified at the base of the little finger and in the hypothenar space. The ulna neurovascular digital bundle was non-viable. Post-operatively the patient was admitted to ITU for cardiovascular and respiratory support. On second inspection twenty-four hours later the infection had spread to involve the entire hypothenar space, deep palmar space and there was pus in the carpal tunnel and distal forearm. Further inspection another forty-eight hours later revealed no infection or necrotic tissue. Tissue samples taken from the initial and second debridement grew a sensitive Lactobacillus gasseri and the patient improved on Clarithromycin. Further tissue samples were negative and definitive procedure was performed with amputation of the little finger trans-MCP joint level preserving remaining viable skin (fillet flap). Skin cover of the hypothenar eminence and ulnar aspect of the hand was reconstructed using the fillet flap and a skin graft.

Conclusion: We have reviewed the available literature on the microbiology of necrotising fasciitis and discussed the first case of necrotising fasciitis caused by Lactobacillus. Although commonly used as a probiotic, and only normally associated with dental infections and endocarditis, there have now been two documented cases of invasive soft tissue infections.

BSSH

The British Society for Surgery of the Hand

Registration

Important notice: Doctors or scientists engaged in research AND presenting a paper will not be charged a registration fee for the day they are presenting if they can confirm in writing that they have no access to study leave expenses. They must, however, pay £35 per day. This is the day delegate rate charged to the Society by the venue for each individual attending.

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

Registration Fees

BSSH Full Members and Associates who are Consultants	£280 Whole meeting £155 One day
BSSH Associates who are Trainees, Companion Members	£180 Whole meeting £105 One day
BSSH Honorary and Senior Members	£70 Whole meeting £35 One day
Trainee Non-members	£230 Whole meeting £130 One day
Other Non-members	£330 Whole meeting £180 One day
Medical Students	£50 Whole meeting £25 One day
Speakers who are Research Doctors or Scientists	£35 per day

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

Registration and Enquiry Desk

The Registration and Enquiry Desk (situated in the Octagon) will be open at the following times:

Thursday: 09:00-17:30
Friday: 07:30-14:45

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

Honorary and Senior Members

Honorary and Senior Members will not pay a registration fee. A charge of £35 will be made for refreshments and luncheon each day. This is the day delegate rate charged to us by the venue for each delegate.

Venue of the Scientific Meeting

The meeting will be held in the Ballroom.

Car Parking

There is no car parking at the Assembly Rooms. The nearest car park is in Charlotte Street (fees: £5.40 for 4 hours, £6.40 for 6 hours, £8.50 for 12 hours).

Accommodation

Preferential rates had been negotiated with the Bath Spa Hotel, Hilton Bath City Hotel, Holiday Inn Express Bath and the M Gallery Francis Hotel. However, all unsold rooms have been released at the end of March and availability can no longer be guaranteed.

Luncheon and Refreshments

Luncheon and refreshments will be served in the Tea Room.

Contributors Information

There will be projection facilities for PowerPoint and Keynote presentations. To avoid delays and ensure the smooth running of the sessions, the use of presenters' own laptops will not be allowed.

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

Posters will be located in the Tea Room/Octagon.

Continuing Medical Education

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

Thursday:	6.5
Friday:	7.0
Total:	13.5

Society Dinner

Thursday 1st May at 19:15 for 20:00
Pump Rooms

Dress code: Business attire

Please note: Due to uneven surfaces at the Pump Rooms, it is not advisable for ladies to wear stiletto heels

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

Prizes

Poster Prize

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

Keynote Lectures

Thursday 30th April

12:00 Evolution of microsurgical bone transplantation
13:30 A scientific approach to disorders of the child's hand

Friday 1st May

12:00 Innovation in hand surgery - One surgeon's experience
13:45 History of upper extremity salvage using microsurgical techniques

Symposia

Thursday 30th April

10:45 To plate or not to plate - That is the question?
14:00 Innovation
16:30 Tissue engineering - Prospects for hand surgical practice

Friday 1st May

10:00 How I examine the unstable wrist
15:30 How I do it

Cadaveric Dissection Anatomy Demonstration

Friday 1st May

08:00 Biomechanics in the hand and carpus

Meetings

Business Meeting

The Business Meeting will be held in the Ballroom at 17:30 on Thursday 30th April 2015.

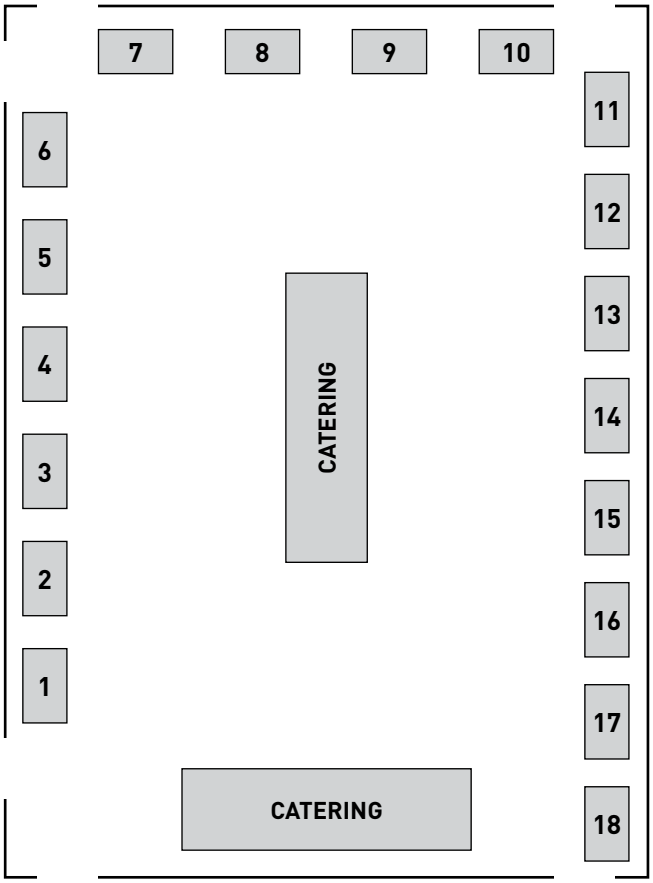
BSSH Meetings in 2015

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

MEDICAL AND TECHNICAL EXHIBITION FLOOR PLAN

Floor Plan – Tea Room (not to scale)

1. Sage Publications
2. Athrodax Healthcare International Ltd
3. Swedish Orphan Biovitrum Ltd
4. Osteotec Ltd
5. Fanin UK Ltd
6. Hospital Innovations
7. Zimmer Ltd
8. Acumed
9. Stryker
10. British Orthopaedic Association
11. Sovereign Medical Ltd
12. Xograph Healthcare
13. Medartis
14. Vertec Scientific
15. Lavender Medical
16. Arthrex Ltd
17. Medical Defence Union
18. BSSH Flexor Tendon/Open Fracture Audit



MEDICAL AND TECHNICAL EXHIBITIORS

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

ACUMED LTD — STAND 8

Huebner House, The Fairground, Weyhill, Hants. SP11 0QN
Telephone: 01264 774 750, Fax: 01264 774 477, Email: niall@acumed.uk.com
Contact: Mr N Hyndman

ARTHREX LTD — STAND 16

Unit 5, 3 Smithywood Business Park, Sheffield S35 1QN
Telephone: 0114 232 9180, Fax: 0114 257 8929,
Email: Rosalyn.barber@arthrex.co.uk
Contact: Ms R Barber

ATHRODAX HEALTHCARE INTERNATIONAL LTD — STAND 2

Hawthorn Business Park, Drybrook, Gloucestershire GL17 9HP
Telephone: 01594 544 440, Fax: 01594 545 800, Email: paul.wirth@athrodax.co.uk
Contact: Mr P Wirth

Athrodax Healthcare is synonymous with Orthopaedic treatment systems for extremity surgery. We have worked with the NHS and Private sector since the mid 1970s. With innovative new single-use products and traditional metal re-useable sets, with hire procedure instruments sets and ground breaking metal bio-absorbable implants, we have plenty to present.

- In2Bones for extremity surgery
- Buxton surgical instrument sets
- The first metal bio-absorbable implant
- Colson Mays type bone grafting set

ATHRODAX
HEALTHCARE INTERNATIONAL LTD

You are very welcome, join us on stand 2.

BRITISH ORTHOPAEDIC ASSOCIATION — STAND 10

35–43 Lincoln's Inn Fields, London WC2A 3PE, Telephone: 020 7405 6506, Fax: 020 7831 2676,
Email: e.storey@boa.ac.uk
Contact: Ms E Storey

BSSH FLEXOR TENDON AND OPEN FRACTURE AUDIT — STAND 18

35-43 Lincoln's Inn Fields, London WC2A 3PE, Email: shehan.hettiaratchy@imperial.nhs.uk
Contact: Mr S Hettiaratchy

FANNIN UK LTD — STAND 5

42 Kingfisher Court, Hambridge Road, Newbury, Berkshire RG14 5SJ
Telephone: 01635 550 100, Fax: 01635 550 050, Email: Richard.forster@fannin.eu
Contact Mr R Forster

HOSPITAL INNOVATIONS — STAND 6

Concept House, Talbot Green Business Park, Pontyclun CF72 9FG
Telephone: 01443 719 553, Fax: 01443 719 560, Email: kellywindsor@hospitalinnovations.co.uk
Contact: Ms K Windsor

LAVENDER MEDICAL LIMITED — STAND 15

Unit 28, Wedgwood Way, Stevenage SG1 4QT
Telephone: 0845 6769 733, Fax: 0845 6769 734, Email: ramzi.saab@lavendermedical.com
Contact: Mr R Saab

MEDARTIS LIMITED **STAND 13**

17A St Christopher's Way, Pride Park, Derby DE24 8JY
Telephone: 01924 476 699, Fax: 01924 472 000, Email: mai.widdowson@medartis.com
Contact: Ms M Widdowson

MEDICAL DEFENCE UNION **STAND 17**

MDU Serviced Ltd, 230 Blackfriars Road, London SE1 8PJ
Telephone: 07979 598 901, tiffany.goddard@themdu.com
Contact: Ms T Goddard

OSTEOTEC LTD **STAND 4**

9 Silver Business Park, Airfield Way, Christchurch BH23 3TA
Telephone: 07202 48 886, Fax: 01202 487 886, Email: Jackie.toms@osteotec.co.uk
Contact: Ms J Toms

SAGE **STAND 1**

1 Oliver's Yard, 55 City Road, London EC1Y 1SP
Telephone: 020 7324 8530, Email: Catherine.marshall@sagepub.co.uk
Contact: Ms C Jarding

SOVEREIGN MEDICAL LTD **STAND 11**

Unit 16, MII Business Link, Parsonage Lane, Stansted CM24 8GF
Telephone: 01279 816 167, Fax: 01279 816 299, Email: james@sovereignmedical.co.uk
Contact: Mr J King

STRYKER **STAND 9**

Hambridge Road, Newbury, Berkshire RG14 5AW
Telephone: 01635 262 455, Email: Amanda.quinn@stryker.com
Contact: Ms A Quinn

SWEDISH ORPHAN BIOVITRUM LTD **STAND 3**

1 Fordham House Court, Fordham House Estate, Newmarket Road, Fordham, Cambridgeshire CB7 5LL
Telephone: 07824 345 045, Email: Umang.vakharia@hotmail.co.uk
Contact: Mr U Vakharia

VERTEC SCIENTIFIC LTD **STAND 14**

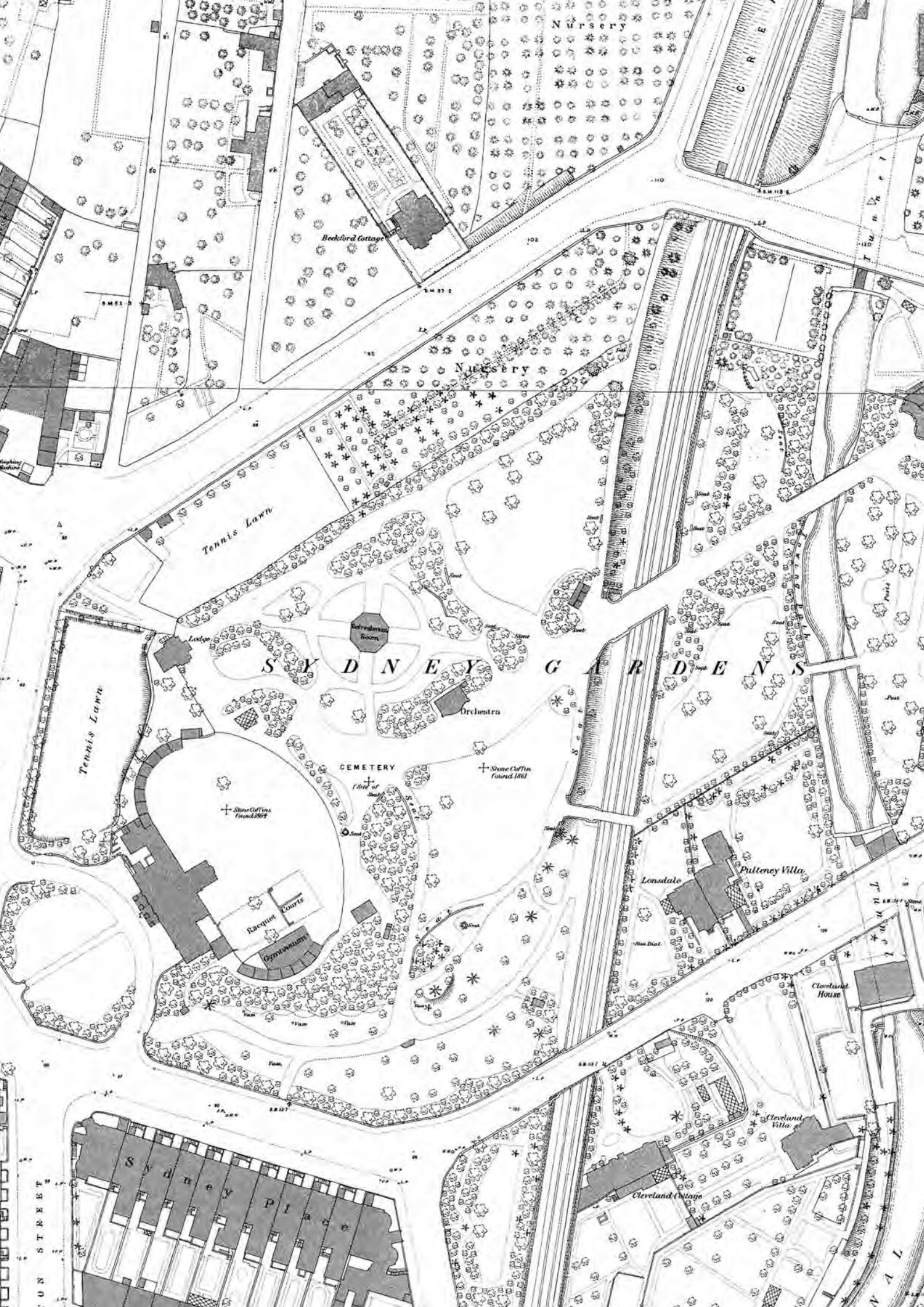
Unit 44, Easter Park, Benyon Road, Silchester RG7 2PQ
Telephone: 0118 970 2100, Fax: 0118 970 1861, Email: sales@vertec.co.uk
Contact: Mr K Lakin

XOGRAPH HEALTHCARE **STAND 12**

Xograph House, Ebley Road, Stonehouse, Gloucestershire GL10 2LU
Telephone: 07775 510 771, Email: neil.staff@xograph.com
Contact: Mr N Staff

ZIMMER LTD **STAND 7**

Lancaster Place, Swindon SN3 4FP
Telephone: 01793 584 500, Fax: 01793 584 653, Email: robin.chapman@zimmer.com
Contact: Mr R Chapman


Nursery
Beckford Cottage
Nursery
Tennis Lawn
Refreshment Room
Lodge
SYDNEY GARDENS
Orchestra
Tennis Lawn
CEMETERY
Stone Coffin found 1861
Stone Coffins found 1864
Racquet Courts
Gymnasium
Lonsdale
Pulteney Villa
Cleveland House
Cleveland Villa
Cleveland Cottage
Sydney Place

BSSH
The British Society for Surgery of the Hand

at the Royal College of Surgeons
35–43 Lincoln's Inn Fields
London WC2A 3PE
Tel: 020 7831 5162
Fax: 020 7831 4041
Email: secretariat@bssh.ac.uk