BOFAS

British Orthopaedic Foot & Ankle Society

BRIGHTON 2014

British Orthopaedic Foot & Ankle Society Annual Scientific Meeting 2014

5th-7th November 2014 Brighton Conference Centre

British Orthopaedic Foot & Ankle Society

Annual Scientific Meeting 2014

Programme 2014

Day 1 Wednesday 5th November

Main Meeting Room(Auditorium 2)

08.00 **Registration** (Foyer) & **Coffee** (Exhibition Hall)

08.45 **Welcome to BOFAS 2014** - Stephen Bendall

09.00 - 10.30 **Instructional 1: TAR - Finding the Limits**
Aim: to discuss TAR in challenging clinical circumstances
Chairs: Sunil Dhar and Murray Penner

09.00 - 09.15 TAR and Extreme Deformity (lateral approach)- Charles Saltzman

09.15 - 09.30 TAR and Infection - Beat Hintermann

09.30 - 09.45 TAR: When it can be done and When should it be done? - Mark Glazebrook

09.45 - 10.00 Extreme TAR Revision - Sunil Dhar

10.00 - 10.30 Discussion and Questions

10.30 - 11.00 **Coffee** (Exhibition Hall)

11.00 - 12.30 **Free Papers**
Chairs: Matthew Solan, Ahmad Malik

12.30 - 13.30 **Lunch** (Exhibition Hall)

13.30 - 15.00 **Instructional 2: Old Problems, New tricks?**
Aim: to discuss surgical techniques that may either be new or be contentious
Chairs: Rick Brown and Simon Clint

13.30 - 13.45 The Dislocated MTPJ - Plantar Plate Repair - Charles Saltzman

13.45 - 14.00 Treating Late Syndesmotic Instability - Mark Davies

14.00 - 14.15 Neglected TA Rupture - Joël Vernois

14.15 - 14.30 MI Heel Shift - Kartik Hariharan

14.30 - 14.45 New Hindfoot Tips and Tricks - Paul Cooke

14.45 - 15.00 Discussion

15.00 - 15.30 **Tea** (Exhibition Hall)

15.30 - 16.00 **Keynote Speaker - Beat Hintermann**
Ankle Arthritis: What Lies Beyond Replacement and Fusion

16.00 - 17.30 **Instructional 3: Heart-sink Cases in Foot and Ankle**
Aim: to explore how experts deal with problems and complications we can all face
Chairs: Callum Clark and Ben Rudge

16.00 - 16.15 Dealing with The Infected TA Repair - James Calder

16.15 - 16.30 Iatrogenic Hallux Varus - David Redfern

16.30 - 16.45 The Iatrogenic Stiff Lesser Toe - Peter Lam

16.45 - 17.00 The Heel That Won't Stop Being Painful - Matthew Solan

17.00 - 17.15 The Stiff Hallux - Use of Hemiarthroplasty - Mark Glazebrook

17.15 - 17.30 Discussion

18.00 - 19.00 **Poster Viewing & Networking Reception with BOFAS Council Members (Exhibition Hall)**

Day 2 Thursday 6th November

Meeting Rooms - See below

08.30 - 12.30 **Workshops**

08.30 - 09.30 **Orthobiologic Solutions** - Meeting Room 15
Wright Medical Technology (Stand 4)

09.30 - 11.10 **Advances in Lesser Toe Surgery with the HAT-TRICK System** - Syndicate Room 3
Smith & Nephew (Stand 3)

Oxbridge Total Ankle Replacement
Solving Problems In Total Ankle Arthroplasty - Syndicate Room 2
Ortho Solutions (Stand 1)

11.10 - 12.30 **Advances in Lesser Toe Surgery with the HAT-TRICK System** - Syndicate Room 3
Smith & Nephew (Stand 3)

Orthobiologic Solutions - Meeting Room 15
*Wright Medical Technology(Stand 4)

11.30 - 12.30 **HYPEREX – The New MTPJ Resurfacing System** - Syndicate Room 2
Ortho Solutions (Stand 1)

DEBATE: Ankle Arthroscopy - Syndicate Room 1
Biomet (Stand 2)

*(Additionally Wright Medical will be running a separate Surgical Skills Lab title
Infinity Total Ankle Replacement for more details please enquire at the Wrights stand number 4)

08.45 - 12.30 **AHP Meeting - Main Meeting Room (Auditorium 2)**

09.00 - 13.00 **GP Meeting - Meeting Room 1 (Ground Floor)**

09.00 - 10.30 **Difficult Cases - Syndicate Room 4**

12.30 - 13.00 **Exhibitors Meeting (Mass Media Space - Company Sponsors only)**

13.00 - 14.00 **Lunch**

14.00 - 15.30 **Free Papers**
Chairs: Andy Molloy, Anthony Perera

15.30 - 16.00 **Tea**

16.00 - 17.30 **Debate: Ankle fractures in UK**
Joint Session with OTS (Auditorium 2)
Aim: to establish problems & solutions to ankle fracture management in the UK with our trauma colleagues
Chairs: Mr Anthony Sakellariou and Iain McFadyen

16.00 - 16.25 Where Are We Now? - Andy Molloy
16.15 - 16.30 Difficult Fracture Patterns - David Elliott
16.30 - 16.45 Difficult Bone - James Davis
16.45 - 17.00 Difficult Patients(diabetics) - Charles Saltzman
17.00 - 17.15 What Are We Going To Do About It? - Iain McFadyen
17.15 - 17.30 Discussion

17.30 - 18.00 **World Orthopaedic Concern (Auditorium 2)**
WOC and the Ukraine - Magdi Greiss
Clubfoot in Malawi - Steve Mannion

18.00 - 18.20 **Speaker - James Ritchie (Auditorium 2)**
From Trench to Breezy Brighton. Medicine at the Front and Rear in World War 1

19.30 **BOFAS Annual Dinner**
(Metropole Hotel Pre-Dinner Reception followed by Dinner)

Day 3 Friday 7th November

Main Meeting Room(Auditorium 2)

08.00 - 09.30 **Instructional 4: OutComm - The Steps So Far**
Chairs: Andrew Goldberg and Colin Howie

08.00 - 08.15 Dr Who? What is the NJR Telling Us? Andrew Goldberg

08.15 - 08.30 PHIN - What's Coming Around The Corner? Matt James

08.30 - 08.45 Amplitude - Who We Are and What We Can Do

08.45 - 09.00 What Can We Learn from the Canadian Registry Experience? Mark Glazebrook

09.00 - 10.30 **Free papers**
Chairs: Roland Russell, Murray Penner and David Loveday

10.30 - 11.00 **Coffee** (Exhibition Hall)

11.00 - 12.30 **Current debates**
Aim: to explore what options there are in some areas of controversy
Chairs: Anthony Sakellariou and Alex Wee

Haglund Deformity - Osteotomy or Excision?
11.00 - 11.10 For Excision - Mark Glazebrook
11.10 - 11.20 For Osteotomy - Carlos Maynou
11.20 - 11.30 Discussion

Repair or Primary Fusion in The Management of Mid-foot Trauma?
11.30 - 11.40 For Repair - Murray Penner
11.40 - 11.50 For Fusion - Chris Blundell
11.50 - 12.00 Discussion

HAV MIS or Open?
12.00 - 12.10 For Open - Dishan Singh
12.10 - 12.20 For MIS - Peter Lam
12.20 - 12.30 Discussion

12.30 - 13.00 **Keynote speaker - Charles Saltzman**
Foot and Ankle - Into The Unknown? - Outcomes Networks and Computerised Adaptive Testing

13.00 - 13.10 **Best Paper/Best Poster Prizes**
Stephen Bendall and Bill Harries

Close of Scientific Meeting.

13.10 - 13.40 **Lunch**

13.40 - 15.30 **BOFAS AGM**

13.40 - 13.50 President Report
13.50 - 14.00 Ed Comm Report
14.00 - 14.10 Sci Comm Report
14.10 - 14.20 Coding Report
14.20 - 14.30 Webmaster Report
14.30 - 14.40 Treasurer Report
14.40 - 14.50 Accountant
14.50 - 15.00 Soap Box - time for floor to bring matter to attention AGM
15.10 - 15.20 New Members Vote/Council and President Elect Appointments
15.20 - 15.30 Presidential Handover to Anthony Sakellariou

British Orthopaedic Foot & Ankle Society

Annual Scientific Meeting 2014

FREE PAPERS ABSTRACTS

FREE PAPERS

Wednesday, 5th November 2014

FP1

The Salto total ankle replacement: mid term survivorship and functional outcomes in a prospective patient cohort

P. Pastides[1], P.F. Rosenfeld[1]
[1]Imperial College, Foot and Ankle Unit, London, United Kingdom

Introduction: The role of total ankle replacements remains unproven within orthopaedic literature. We present a prospective series of patients who underwent a SALTO TAR (Tornier) between October 2006 and January 2014.

Methods: A cohort of 53 TAR (50 patients) were prospectively followed up and assessed clinically, radiologically and asked to complete FAOS, VAS and Modified AOFAS scores. Four patients had bilateral procedures. The mean age was 71 years old (range 42-92). The mean follow up was 55 months (range 6-92). Nineteen TARs (19 patients) have a follow up of more than 60 months.

Results: Our survival rate is 98% as one patient proceeded to have an ankle fusion at 12 months due to loosening. Three patients had ankle arthroscopies at 1 year post TAR; one for removal of a fibula cyst, one for synovitis in the lateral gutter and another for fibula impingement. One patient had an early postoperative infection. Mean overall FAOS scores were 73.4 for the entire cohort and 74.2 for the cohort with over 5 years follow-up. Mean modified AOFAS scores for the entire cohort and the cohort with over 5 years follow up was 71.5 and 78.9 respectively. Mean VAS scores for the entire cohort and the cohort with over 5 years follow-up was 18.8 and 25.8 respectively.

Discussion: Ankle joint arthrodesis has been shown to be a reliable in relieving pain and result in good patient satisfaction. However, total ankle replacement provides an alternative surgical option for the management of ankle arthritis. The improving survivorship of ankle replacements is making this an increasingly popular option. Our follow-up of almost five years as an entire cohort, but also those with over five years, show that these latest generations of TAR have excellent mid term survivorship, accompanied by high levels of patient satisfaction and function.

FP2

The early multicentre results of the rebalance total ankle replacement

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[1]Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom,
[2]Falun University, Falun, Sweden,
[3]Lund University, Lund, Sweden,
[4]Lund and Spenshult University, Spenshult, Sweden,
[5]Charles University, Prague, Czech Republic

Introduction: We present the early results of 220 Rebalance Total Ankle Replacements performed in 6 centres in 4 different countries.

Methods: The Rebalance Total Ankle Replacement is a new 3 component uncemented mobile bearing prosthesis with a surface coating of ´bonemaster´ and an ´e´ poly bearing. The prosthesis was released in a limited way in May 2011. Since then 220 replacements have been implanted in 218 patients in 6 centres in 4 different countries(UK ,Sweden,Canada,Czech Republic). All the x-rays and case notes were reviewed.63 prostheses have a minimum follow up of 2 years. Outcome measures included revision of the prosthesis, and the incidence of progressive and non-progesssive radiolucent lines around the prosthesis.

Results: 7 patients underwent revision or are awaiting revision of their prosthesis. Reasons for revision included loosening(2), infection(1), malposition(2), periprosthetic fracture(1), impingement(1). 9 patients had non-progressive radiolucent lines and 2 patients had progressive radiolucent lines. 1 patient with progressive radiolucent lines is waiting revision for suspected infection. 8 patients suffered fractures to the lateral malleolus and 4 to the medial malleolus. There were no cases of balloon osteolysis. 29 patients had pre-op AOFAS scores= 41(12-67). 21 had 1 year post-op AOFAS scores= 73.5(26-100). 12 had 2 year AOFAS scores= 75.5(50-100).

Conclusion: The early results are encouraging and we believe support its wider use.

FP3

Complication rates amongst 4 surgeons on a consecutive series of 202 total ankle replacements

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[1]Wrightington Hospital, Wrightington Foot and Ankle Unit, Wigan, United Kingdom

Introduction: The aim of this study was to identify the rate of complications of total ankle replacement in a single Centre to help with informed patient consent.

Methods: Between 2008 and 2012, 202 total ankle replacements (TARs) were performed by 4 surgeons at our Institute. Data was collected on all patients; demographics, arthritic disease, pre-operative deformity, prosthesis and all early and late complications.

Results: 4 surgeons (A, B, C, D) performed 63, 55, 48 and 36 TARs (178 De Puy Mobility and 24 Corin Zenith). 130 patients had primary osteoarthrosis, 35 had rheumatoid and 36 had post traumatic osteoarthrosis. There were no differences in patient demographics for each surgeon. There were 3 deep infections (A,B,C,D: 1,0,2,0). There were 18 medial malleolar fractures (8 intra-operative [4,1,1,2], 3 early (< 3 months) [1,1,0,1] and 7 late (>3 months) [2,2,2,1]). There were 2 lateral malleolar fractures, both intra-operative (0,0,1,1). There were 15 patients who developed superficial wound infections, which resolved fully with oral antibiotics (4,3,4,4). A further 7 patients had a delay to wound healing (wound not fully healed at 3 months) (4,0,2,1); 2 of these developed deep infection and failed. 22 patients had persistent medial gutter pain (9,4,5,4); all had undergone Mobility TAR. 4 patients developed recurrent edge loading and have had to be revised (4 converted to TTC fusion) (2,0,2,0). We report complications in 32% of patients. Overall 9 TARs failed and underwent revision to fusion (2,2,5,0).

Conclusion: We report an overall complication rate of 32% following TARs, however most are minor and don't affect clinical outcome. We had a 1.5% deep infection rate. Complication rates were comparable between 4 surgeons. There was a difference in medial gutter pain rate between implants (13% v 0% Mobility to Zenith). This data provides detailed complication rates for informed consent.

FP4

Outcomes of salvage procedures for failed total ankle replacements

N.S. Duncan[1], B. Chowdry[1], M. Raglan[1], S. Dhar[1]
[1]Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom

Introduction: We report the outcomes of salvage procedures in total ankle replacement (TAR) in a single surgeon series.

Methods: This study was a retrospective review of patients who had undergone salvage procedures with tibio-talo-calcaneal (TTC) fusion for failed TAR over a period from 1999-2013 in a single centre. In this period, 317 TAR were performed of which 11 have failed necessitating conversion to TTC fusion. Clinical documentation and radiographs were reviewed for cause of failure, type of graft for fusion, time to radiological/clinical union and complications including further surgeries.

Results: The causes of failure of the TAR were pain from instability/impingement in 8, fracture in one, subsidence of the talar component in one and infection in one. From the group of 11 patients, 8 patients went onto union at a mean of 10 months (7-14). All 8 patients had femoral head structural allografts to maintain limb length for the procedure and 3 required a secondary procedure to dynamise the nail. 2 patients with femoral head structural allografts developed infections necessitating removal of the graft and conversion to an external fixator of which one united and the other developed a painless fibrous union. 1 patient developed non-union with progressive deformity of the ankle resulting in a Symes amputation.

Conclusions: From our series of patients we have demonstrated that failure of TAR requiring salvage procedures is a relatively rare event (3.5%). The use of TTC fusion is successful in the majority of patients and the use of femoral head structural allografts allows preservation of leg length with good rates of union.

FP5

How do 5-year patient reported outcomes (PROMS) of TAR compare with TKR and THR?

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Introduction: Ankle arthritis is a leading cause of pain and disability. The effect of this condition on physical and mental health is similar to end stage hip arthritis. There is paucity of literature on PROMS following total ankle replacements (TAR) in comparison to total hip replacement (THR) or knee replacement (TKR). We aimed to study 5 year outcomes of TAR in comparison with TKR and THR.

Methods: PROMS data from patients who underwent a primary THR, TKR or TAR from March 2003 to 2013 were collected from our hospital patient registry. They were divided into 3 groups based on the type of primary joint replacement. Patient demographics and patient reported outcomes (WOMAC, SF-36 scores and patient satisfaction scores at follow up) were compared at pre-op and 5 year follow up.

Results: There was data available on 1920 THR, 2582 TKR and 248 TAR patients. Pre-operatively, TAR patients reported higher function scores when compared to THR and TKR (40.2 vs. 34.2 and 35.8;

$p < 0.05$). For SF-36 scores, there was no difference between groups for general health, role emotional components ($P>0.05$); TAR patients reported similar scores to TKRs for physical domains; to THRs for the mental domains ($P>0.05$). At 5 years post-op, TARs reported lower scores than THRs and TKRs for function and stiffness. For SF-36 scores, TARs reported similar outcomes to THR and TKR for mental health components ($p>0.05$), similar scores to TKR for 3/4 physical domains ($p< 0.05$), but lower satisfaction rates for ADL and recreation when compared to THR ($P< 0.05$).

Conclusion: TAR patients had similar outcomes to THR or TKR patients for disease specific and mental health domains, and lower patient satisfaction rates in terms of pain relief, ADL and recreation. Further research is warranted including clinical outcomes along with PROMS with a long term follow up.

FP6

The first 3-years of the national joint registry for ankles: patterns of uptake and compliance, and a comparison with that of hips, knees and shoulders

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The National Joint Registry (NJR) was established in 2003, and was extended to include ankle arthroplasty on 1st April 2010, and shoulder and elbow arthroplasty in April 2012. The aim of this study was to evaluate the uptake of the NJR for ankle arthroplasty over its first 3 years. This is compared to the first 3 years of hip and knee data, and the first year of shoulder and elbow data.

The methods of measuring compliance are also evaluated. NJR compliance is measured by comparing the number of procedures submitted to the NJR, against the number of levies raised through implant sales. This applies to all of the UK, and both independent and NHS providers. However, compliance can also be measured by comparing NJR submissions with data submitted to the Hospital Episode Statistics (HES) database. This only relates to NHS institutions in England.

The NJR ankle data was compared to implant data, and adjusted to compare to HES data, to evaluate the different methods of measuring compliance. We also compared these figures with the first 3 years for hip and knee arthroplasties and the first year for shoulder and elbow arthroplasties.

Results: In 2011 there were 493 arthroplasties and the compliance was 64% against industry data. In 2012 there were 590 procedures with compliance improved to 77% against industry data. When adjusting NJR to compare with HES data, the compliance was 87% in 2012., with 507 ankle arthroplasties registered with the NJR and 582 on HES data. The reasons for this discrepancy are discussed. The specific difficulties of capturing ankle revisions are discussed, as some get revised to arthrodeses.

The uptake is significantly higher than the first year for all other joints (shoulders 52%, hips 57%, knees 57%, and elbows 60%).

FP7

PROMS 2.0 in elective foot and ankle surgery early experience from University Hospital of South Manchester

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Introduction: PREMS and PROMS are part of the national initiative of the DoH. They measure quality from patient perspective and also help patient choice. We present our pioneering experience of PROMS 2.0 which is a semi automated web based system to collect and analyse outcome data in real time.

Materials and methods: Data was prospectively collected from January 2013 to June 2014. Outcome measures included EQ-5D VAS, EQ-5D Health Index, and MOxFQ, collected pre-operatively and post-operatively. Patient Personal Experience (PPE-15) was collected postoperatively. A semi-automated e mail based system - Amplitude - was used.

Results: 345 patients consented to participate.147 patients (42.6%) and 168 pathways (47%) signed up for PROMs 2.0 programme. 40 (27%) did not complete either pre-op or post op questionnaire after signing up. 30 patients (20.4%) completed pre-op and at least one post op score. 99 patients (58.9%) completed PPE questionnaire. 83% of respondents had improved or unchanged EQ-5D VAS score, and EQ-5D Health Index. MOxFQ scores showed improvement in over 80% of responses. 88% responded favourably (YES) to PPE 15 questionnaire.

Conclusion: Our data shows an improvement in PROMS and a favourable PREMS in excess of 80% of our elective foot & ankle patients following surgery. Patient response was higher for PPE questionnaire compared to other PROMs outcomes. Methods to increase patient enrolment and to encourage higher participation are required. We feel patient education and simplification of PROMS 2.0 are the key.

FP8

Mid-term outcomes following first metatarsophalangeal joint replacement using the Toefit-PlusTM prosthesis

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[1]Royal Derby Hospital, Derby, United Kingdom

Introduction: This study evaluates the mid-term results of first metatarsophalangeal joint replacement (MTPJR) for hallux rigidus using the Toefit-PlusTM prosthesis.

Methods: We prospectively studied the outcomes of 86 MTPJR in 73 patients using the AOFAS-HMI score and radiological follow up over a period from 2006 to 2013, with surgeries performed by a single surgeon at two centres. Patients were reviewed, scored and radiographs obtained pre-operatively and then at intervals of 6 weeks, 6 months, 12 months and then yearly. The mean follow up was 33 months (2-72).

Results: The mean AOFAS score of the patients not requiring revision at 1 year was 92, at 2 years was 94, at 3 years was 91, at 4 years was 99, at 5 years was 93, at 6 years was 100 and at 7 years was 97. 18 joints have either been revised or listed for revision giving a revision rate of 21%; this occurred at a mean of 33 months post-surgery. Reasons for revision included loosening of components in 13, infection in 1, dislocation in 2, malalignment in 1 and persistent pain in 1. Eight patients sustained intra-operative fractures requiring circlage wiring, of which 7 went on to union and one required revision. 25 patients had evidence of radiological loosening of which 22 were around the phalangeal component and 3 were around the metatarsal component.

Conclusions: First MTPJ replacement resulted in improved outcomes in patients with hallux rigidus who do not require revision in the medium term, however the revision rate is unacceptably high and as such we have discontinued use of this prosthesis. Radiological loosening of the components is high and needs monitoring for progression which may necessitate revision.

FP9

Clinical and radiographic outcomes of a large series of toe fusions using the Smart Toe implant

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Introduction: In 2009 the Smart Toe implant was introduced as an option for lesser toe fusion in our department. The Smart Toe is an intramedullary device made from Nitinol, an alloy that can change shape with a change of temperature, expanding within the intramedullary canals of the proximal and middle phalanx to achieve fixation. The advantages of the Smart Toe are that patients are spared 6 weeks with K-wires protruding from their toes and there is no need for wire removal. We conducted a retrospective review of radiographic and clinical outcomes to assess the performance of this implant.

Methods: We present a consecutive series of 192 toe fusions using the Smart Toe implant in 86 patients, between January 2009 and November 2013. All radiographs and case notes were reviewed to assess for radiological fusion, satisfactory clinical outcome and complications.

Results: One patient was lost to all follow up. Radiographic follow up was available for 186 of 192 implants (95%). 137 toes (74%) were fused by 6 weeks, and 152 (81%) at final follow up. Clinical notes were available for 182 implants (94%) in 85 patients. At 6 weeks 50 patients reported satisfactory outcomes in 105 toe fusions (58%). At final follow up 70 patients reported satisfactory outcomes in 150 toe fusions (82%). 7 patients experienced complications in 19 toes (10%). 2 implants were broken and 2 implants had cut out. There were 3 phalanx fractures. In all 4 toes were revised, and there was 1 amputation. Clinically, out of the 34 non-united toes only 5 were symptomatic.

Conclusion: Overall 82% of toe fusions using the Smart Toe implant yielded entirely satisfactory clinical outcomes. Radiographic fusion occurred in 81% but most non-unions were asymptomatic. There were a small number of significant complications, and 4 patients out of 85 required revision surgery.

FP10

Forefoot deformity in rheumatoid arthritis - a comparison of shod and non-shod populations

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[1]University Hospital Aintree, Foot and Ankle Unit, Liverpool, United Kingdom,
[2]Abhishek Hospital, Foot and Ankle Centre, Gujarat, India,
[3]Royal Gwent Hospital, Newport, United Kingdom

Introduction: All reported RA forefoot deformities in the literature so far have arisen from shoe wearing populations. Our aim in this study was to compare hallucal deformities seen in a shod to a non-shod population.

Methods: A case-control study was undertaken in two specialist foot and ankle units, one in India and one in the UK. All patients suffering from RA and attending for consideration of forefoot surgery from January 2007 to October 2013 were included in this study. Standardized anteroposterior weight bearing radiographs were obtained to measure the hallux valgus, inter-metatarsal and metatarsus primus varus angles.

Results: In the shod population, there was 1 hallux varus deformity, 10 without hallucal deformity and 90 feet with varying degrees of hallux valgus deformity. In contrast, in the unshod population, there were 19 hallux varus deformities and 6 hallux valgus deformities. There was great variability in the lesser toe deformity seen. In the shod population, it was most common to see dorsal subluxation or dislocation, with the 5th toe in a varus position. This was seen in 95% (n=96) of the shod population. In the unshod population, the most common lesser toe deformity seen was varus deviation or dislocation. This was present in 80% (n=20) of the unshod population.

Conclusion: Instability of the metatarsophalangeal joint in the rheumatoid foot predisposes it to significant deformity. External forces of shoe wear dictate the deformity, with hallux valgus being the most likely scenario in a shoe-wearing patient. In the non-shoe wearing population, intrinsic forces and weight bearing forces determine the deformity, with hallux varus being the most common presenting problem.

FP11

Corticosteroid injections for Morton's neuroma - does ultrasound guidance improve efficacy? A randomised controlled trial

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[1]University Hospitals of Leicester, Leicester, United Kingdom

Background: The purpose of this double-blind randomised controlled trial was to assess whether ultrasound guidance improved the efficacy of steroid injections for Morton's neuroma (MN).

Methods: Following IRB approval, cases with MN confirmed on ultrasound were randomised to 2 groups: Group 1 received ultrasound-guided injections (1ml 40mg Depo-Medrone and 1ml 1% lignocaine) and Group 2 received the same injection under sham ultrasound guidance. All ultrasounds and injections were performed by a single MSK radiologist. Patients were reviewed at 3 months. The primary outcome measure was the VAS for pain. The study was powered to detect a MCID of 15mm on a 100mm VAS scale between the groups (21 per group). Secondary outcomes included the Manchester-Oxford Foot Questionnaire (MOxFQ), Johnson's satisfaction scale and failure of treatment.

Results: 50 cases (feet) were recruited for this study. Demographics included 29 female to 21 male with a mean age of 58 years (29 - 88 yr). Five cases declined further participation and were excluded from analysis. The VAS score improved significantly in both groups (64 to 25mm in Group 1 vs. 67 to 34mm in Group 2; $p< 0.005$) but there was no significant difference between the groups ($p=0.08$). Similarly, the improvement in MOxFQ scores was also significant in both groups (38 to 18 in Group 1 vs. 38 to 23 in Group 2; $p< 0.05$) but did not reach statistical significance when the groups were compared ($p=0.086$). The Johnson's satisfaction scale was however, significantly better in Group 1 ($p=0.011$). Seventy-percent in Group 1 were either completely satisfied/ satisfied with minor reservation compared to only 50% in Group 2. At 3 months, 17% in Group 1 versus 36% in Group 2 failed treatment.

Conclusion: The results suggest that the use of ultrasound guidance improved the efficacy of steroid injections for symptomatic Morton's neuroma.

FP12

Abdominal fat transfer for recreating fat pad in hind foot and forefoot

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[1]The Robert Jones and Agnes Hunt Orthopaedic Hospital, Gobowen, United Kingdom,
[2]University Hospital Coventry and Warwickshire, Coventry, United Kingdom,
[3]Russells Hall Hospiatl, Dudley, United Kingdom

Introduction:

- Primary functions of heel and forefoot fat pad - shock absorber at heel strike, energy dissipation, load bearing, grip and insulation.
- Reliability of weight bearing heel pad thickness measurements by ultrasound has been determined by Rome et al.1
- Importance of soft tissue fillers has been recently popularised by Coleman.2

Methods and materials:

- Harvesting done by standard low pressure liposuction using small cannula
- Grafting using small needle depositing the small globules of fat in multiple layers of soft tissue.
- There is an expectation that up to 50% of the fat will be lost and so upto 19mls of fat placed per foot.
- Patients were kept NWB for 4-6 weeks post op and then allowed to mobilise fully.
- Case notes were prospectively collated and analysed.
- Pre and post-op ultrasound scans were performed to document the depth of the heel/forefoot fat pad.
- Clinical pictures were taken and post-op patient satisfaction scores were done as well.

Results:

- We treated 9 feet in 5 patients.
- 5 heel fat pad transfers and 4 forefoot.
- Pain completely relieved in all feet
- No complications
- Average pre-op VAS - 3/ Post-op - 9
- Average pre-op AOFAS score - 70/ post-op - 105.
- Follow-up 6months - maximum 23 months.

Conclusion:

- Fat transfer is usually used for cosmetic reasons and occasionally to improve scars.
- Very few reports from South America have been published for patients using high heels giving pain but none for patients with a pathological anomaly.
- The technique seems to highly effective with no complications so far.
- It is currently being used on other painful problems in other areas of the sole with equal success.
- Abdominal fat transfer is an innovative technique aimed at getting rid of the ‘heel pad syndrome’

FP13

The footprint of the Achilles tendon - a cadaveric study

M. Ballal[1], C. Walker[1], A. Molloy[1]
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Introduction: The insertion footprint of the different muscles tendon fascicles of the Achilles Tendon on the calcanium tuberosity has not been described before.

Method: Twelve fresh frozen leg specimens were dissected to identify the different Achilles Tendon fascicles insertion footprint on the calcaneum in relation to their corresponding muscles. Further ten embalmed cadaveric leg specimens were examined to confirm an observation on the retrocalcaneal bursa.

Results: The superficial part of the AT insertion is made by tendon fascicles from the medial head of the gastrocnemius muscle which insert over the entire width of the inferior facet of the calcaneal tuberosity. In three specimens, this insertion had continuity with the plantar fascia in the form of periostium. The deep part of the TA insertion is made of fascicles from the soleus tendon which insert on the medial aspect of the middle facet of the calcaneal tuberosity while the lateral head of the gastrocnemius tendon fascicles insert on the lateral aspect of the middle facet of the calcaneal tuberosity. A bicameral retrocalcaneal bursa was present in 68% of examined legs.

Conclusion: This new observation and description of the Achilles insertion footprint and the retrocalcaneal bursa may allow a detailed understanding of the function of each muscular part of the gastrosoleous complex. This has potential significant clinical relevance in the treatment of Achilles pathologies around its insertion.

FP14

Plantaris excision in the treatment of non-insertional Achilles tendinopathy in elite athletes

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Background: Achilles pathology is a serious and frequently occurring problem, especially in elite athletes. Recent research has suggested a role for the plantaris tendon in non-insertional achilles tendinopathy. We report on the outcomes after excision of the plantaris tendon in elite athletes.

Aim: To assess whether or not excising the plantaris tendon improves the symptoms of Achilles tendinopathy in elite athletes.

Methods: A group of 32 elite athletes who underwent plantaris tendon excision to treat medially located pain associated with non-insertional Achilles tendinopathy were investigated. Outcomes were assessed with pre and post-operative Visual Analogue Scores (VAS) for pain and the Foot and Ankle Outcome Score (FAOS) as well as time to return to sport and satisfaction scores.

Results: At a mean follow-up of 22.4 months (12-48), 29/32 (90%) of athletes were satisfied with the results. 30/32 athletes (94%) returned to sport at a mean of 10.3 weeks (5-27). The mean VAS score improved from 5.8 to 0.8 ($p < 0.01$) and the mean FAOS improved in all domains ($p < 0.01$).

Conclusions: The plantaris tendon may be responsible for symptoms in some patients with non-insertional Achilles tendinopathy. Excision using a mini-incision technique carries a low risk of complications and may provide significant improvement in symptoms enabling an early return to elite level sports.

FP15

Non-operative treatment of tendo-achilles rupture: is “gap size” important in determining suitability for functional rehabilitation?

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Introduction: The treatment of acute rupture of the tendo-achilles remains controversial. There is good evidence to suggest that outcomes are the same for both operative and non-operative treatment when a functional rehabilitation program is utilised. However, debate continues as to whether the radiological gap-size between the proximal and distal remnants of the tendon has an influence on the suitability for non-operative management.

Methods: All adult patients who attended the emergency department with a clinically suspected tendo-achilles rupture were place in a plantarflexed cast, and underwent MRI scanning to confirm the diagnosis. They were then counselled on the risks and benefits of operative versus non-operative treatment. Patients opting for non-operative treatment were asked to take part in the study and treated using a functional rehabilitation programme. Gap sizes were determined using a standardised protocol by a single musculoskeletal radiologist blinded to the clinical outcomes.

Results: A total of 69 patients have been recruited into the study, 40 have complete their one year review. There were two re-ruptures. The average age was 42.4 years (range 19-70). The average gap size recorded by MRI was 40.4mm (range 6-110). The average ATRS score was 80 (range 17-100) and the single limb heel raise percentage of contralateral side was 64.8% (range 4-115). The Spearman rank correlation coefficient comparing gap size and ATRS score was 0.272 ($p=0.045$) and for gap size and strength was 0.158 ($p=0.165$).

Conclusion: This study shows a weak positive correlation between MRI measured gap size of the ruptured tendo-achilles and the Achilles tendon Total Rupture Score at one year. No correlation could be demonstrated between gap size and strength at one year. These results suggest that the MRI measured gap size is unimportant in predicting outcome and hence suitability for non-operative treatment of tendo-achilles rupture using functional rehabilitation.

FP16

Return to sport following syndesmosis injuries in 64 elite athletes - factors affecting need for stabilization and presentation of a modified classification

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Isolated syndesmosis injuries lead to a prolonged time away from sport. Stable injuries respond well to conservative management whilst unstable injuries with diastasis require fixation. However, grade II injuries may have latent instability which is only present on stressing the syndesmosis during loading. They are difficult to identify with the current classification system and inappropriate treatment can lead to late morbidity.

A prospective series of 64 isolated grade II syndesmosis injuries in professional athletes are reported. Clinical and MRI findings were used to determine whether the injury was stable (grade IIa) or unstable requiring arthroscopic assessment and possible surgical stabilization (grade IIb).

38/64 athletes had a possible grade IIb injury. 36/38 were deemed unstable at arthroscopy and stabilized with a Tightrope. At a minimum of 12 months all athletes returned to their previous level of sport - grade IIa injuries returned to play significantly earlier that grade IIb (64 versus 45 days; $p< 0.001$). Injury to both AITFL and deltoid ligaments had a significant chance of being unstable whereas concomitant injury to the ATFL appeared protective leading to an earlier mean time to return to sport and were less likely to be suggesting a different mechanism of injury. Although the external rotation test was sensitive it was less specific than a positive squeeze test which was associated with increased severity of injury with a longer return to sport and increased need for stabilization.

We have identified specific clinical and radiological findings to increase accuracy of differentiating stable from unstable grade II syndesmosis injury enabling appropriate management, predictable time of return to sport and minimizing the risk of later symptoms. Those athletes with no diastasis but AITFL rupture, injury to the deltoid and/or a positive squeeze test are more likely to have an unstable syndesmosis and may warrant arthroscopic assessment.

FP17

A simplified, validated method for measuring fibular reduction on CT scan

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Fibular malreduction is an important cause of pain after ankle fracture fixation. Plain radiographs have been shown to be unreliable at measuring mal reduction when compared to CT scans. Davidovitch developed a validated method of measuring malrotation, diastasis and AP translation. His method relies on finding the axis of the fibula. Elgafy demonstrated that the fibula morphology varies greatly, and in many cases it can be difficult finding the fibular axis.

We developed a new method of measuring the ankle syndesmosis on CT scans. We used CT scans in 16 normal subjects after a power calculation. Two assessors independently measured the ankle syndesmosis using the davidovitch method, and our new protocol.

We demonstrated that after statistical analysis (Pearson Product Moment Correlation) our method showed improved inter-observer reliability (0.99 and 0.95 vs 0.77 and 0.58 respectively) for diastasis and AP translation, and improved intra-observer reliability (0.99 and 0.99 vs 0.96 and 0.91 respectively). We found that fibular rotation was difficult to measure accurately.

We believe that out method is a simple, accurate and reproducible system for measuring the ankle syndesmosis. We believe that this method could be used to assess fibular reduction after obtaining CT images of the uninjured side for comparison.

FP18

Syndesmotic arthrodesis for chronic inferior tibiofibular joint instability

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Introduction: Failure to adequately treat an injury of the syndesmosis leads to poor functional outcomes and posttraumatic arthritis. Many techniques have been proposed to salvage chronic instability. We report on the largest series of chronic syndesmotic injuries to be managed by syndesmotic arthrodesis from Europe to date.

Aim: To determine the radiographic and clinical outcomes for this technique at our institute.

Methods: Patients were followed-up prospectively. Relevant radiological and clinical data were obtained from electronic and case note review. The AOFAS score was utilised.

Results: A total of 6 patients were found. The average age was 33 years and the mean length of follow-up was 20 months.

Arthrodesis was radiologically successful in all cases. Mean pre-operative and post-operative AOFAS scores were 70 and 82 respectively. All patients had some persistent ankle pain. One third had radiological progression of ankle osteoarthritis. Complications consisted of one patient with scar sensitivity.

Conclusions: This technique has a role in the salvage of chronic ankle syndesmotic instability. However patients must be counselled to the likelihood of ongoing symptoms.

FP19

The risk of talar shift in nonoperatively treated Weber B lateral malleolar fractures with suspected medial injury: a clinical and radiological outcomes analysis

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Introduction: Isolated Weber B lateral malleolus fractures heal uneventfully, but concern that late subluxation may occur due to unrecognised medial ligament tearing, despite an intact mortice on initial radiographs, often results in overtreatment. The aim of this study was to determine the incidence of late talar shift with nonoperative management in a cohort of patients with no initial talar shift, and also record functional outcomes at 16-28 months following injury.

Methods: This was a retrospective review of 129 patients with Weber B lateral malleolar fractures initially referred to the fracture clinic between October 2011 and October 2012. Eight had obvious talar shift and therefore underwent surgery, with the remaining 121 treated in plaster (n=41), a Velcro boot (n=70) or bandage (n=10). No stress x-rays or MRI scans were performed. Weight-bearing was permitted as pain allowed. Radiographs taken on discharge from the clinic were reviewed to assess talar shift. Functional outcomes assessment was carried out using Manchester Oxford Foot Questionnaire and Olerud-Molander score.

Results: None of the 121 patients had talar shift initially; 21 patients where medial injury was strongly suspected were closely followed and had check x-rays more often (average 2.9 appointments per patient) than the other groups. No patients had talar shift in any of the subsequent x-rays and therefore none underwent delayed internal fixation. The mean MOXFQ and Olerud-Molander scores were 27 and 78 respectively in 57 patients and the functional outcomes were not influenced by type of immobilisation or suspected medial injury.

Conclusion: Our observation is that the risk of late talar shift is likely to be low in patients where initial x-rays had showed no talar displacement. It may be unnecessary to perform additional tests/imaging to establish the integrity of the medial ligament as satisfactory functional results are routinely observed.

FP20

Has the best practice tariff for hip fractures resulted in patients with unstable ankle fractures waiting longer for surgery?

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Introduction: The Best Practice Tariff (BPT) for hip fractures was introduced in April 2010 to promote a number of quality markers, including surgery within 36 hours. We conducted an audit to see whether the introduction of the BPT has had an inadvertent adverse effect on delay to fixation of unstable ankle fractures.

Method: We compared the delay to surgery for 50 consecutive patients with unstable ankle fractures in the 2009 financial year with another 50 patients treated in the 2011 financial year, ie one year after the introduction of the BPT. There were no other changes in service in our department in this period. All radiographs were reviewed and classified using the Lauge-Hansen system by 2 surgeons. Excel was used for data analysis using unpaired T-Test and chi-squared test to assess significance.

Results: 2 patients with pilon fractures were excluded from each group. Demographics and fracture pattern between the remaining 48 patients in each group were similar. The mean delay to surgery before BPT was 2.2 days compared with 3.8 days after its introduction ($p = 0.01$). 7 patients waited more than 5 days for surgery before BPT compared with 17 patients after its introduction ($p < 0.001$). There was 1 manipulation under anaesthetic (MUA) before BPT and 8 MUAs in 7 patients after its introduction ($p < 0.001$).

Conclusion: There is a significant association between the introduction of BPT for hip fractures and an increase in the delay to surgery for patients with unstable ankle fractures by an average of 1.6 days. More patients waited more than 5 days for surgery and there were more MUAs. We postulate that in a resource-limited NHS, prioritizing one patient group inevitably disadvantages others. Orthopaedic trauma services must adapt to national guidance to ensure all patients are treated in a timely fashion.

FP21

Soft tissue complications of the surgical treatment of unstable fractures of the ankle: is it timing of the surgery or the implants?

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Introduction: Early stabilization has the potential to expedite early return to function and reduce hospital stay thus reducing cost to health care. A clinical audit was performed to test the hypothesis that early surgical stabilization lowers the rate of soft tissue complications and is not influenced by choice of distal fibular implants used for stabilization of ankle fractures.

Methods: All surgically treated adult patients with isolated unstable ankle fracture were included from April 2012 to April 2013 at a MTC in UK. Patients with poly-trauma were excluded.

All patients underwent a standard surgical protocol: aim for early definitive surgical fixation (ORIF) within 24 hours however if significantly swollen than temporary stabilization with an external fixation followed by a staged definitive fixation.

Results: In total 172 consecutive unstable ankle fractures were included in one-year study period. Definitive fixation (ORIF) was achieved in 91% patients with only 9% patients required temporary stabilization with external fixation. Fibular locking plates were used in 59(38%) patients compared to conventional one-third tubular plates in 91(60%) patients.

In ORIF group 42% (73) patients were operated within 24 hours of admission whilst 58% (83) under went early fixation after 24-72 hours.

At one year follow up complications were recorded in 18(11%) patients including metal irritation requiring removal of implant in 6(4%) patients. Wound complications and deep infection leading to a further surgical procedure in 8(5%) patients.

There was no statistical difference between complication rates ($p=0.016$) in early versus delayed fixation groups. Fibular locking plates were associated with higher soft tissue complications (13%) as compared with conventional plates (2%) ($p=0.004$).

Conclusion: Our study showed that the timing of the surgery has less influence on the complications of the ankle fracture fixation. However choice of implants requires careful consideration and we suggest caution against use of current fibular locking plates.

FP22

Return to sport following lateral ligament repair of the ankle in professional athletes

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Lateral ligament injuries of the ankle account for up to 50% of all sporting injuries. Recent literature has supported early reconstruction of severe acute lateral ligament injuries in professional athletes suggesting that it may allow earlier rehabilitation whilst reducing the incidence of recurrent instability. The results of acute lateral ligament reconstruction in respect to return to sport in professional athletes has not been previously reported.

A consecutive series of professional athletes were treated operatively for clinically and radiologically confirmed grade III lateral ligament injury. All patients were assessed at a minimum of 2 years post surgery.

33 ankles in 33 athletes underwent anatomical reconstruction (modified Brostrum repair) for acute lateral ligament injury. 22/33 had isolated complete rupture to ATFL and CFL whilst 11/33 had additional injuries - three OCL, six deltoid ligament injuries, a syndesmosis injury and a combined deltoid ligament injury with OCL. The mean time to return to training and sports for those with an isolated lateral ligament injury was 58 days (range 49-110) and 72 days (range 56-127) respectively. However, for those with a concomitant injury the time to return to training and sports 98 days (63-152) and 116 days (82-178) days respectively. This delay was significant ($p< 0.01$). No patient developed recurrent instability of the ankle and all returned to their pre-injury level of professional sports.

Lateral ligament reconstruction is a safe and effective treatment for acute severe lateral ligament ruptures providing a stable ankle and an expected return to sports at about 10 weeks. Associated ankle injuries may allow the athlete to return to the same level of competition but the club and player need to know that timing of return may be delayed.

FP23

Step-by-step recognition of peroneal tendon dislocation in association with calcaneal fractures

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Introduction: Although dislocation of the peroneal tendons (PT's) in association with calcaneal fractures has been described over 25 years ago, it frequently passes unrecognised by radiologists and orthopaedic surgeons. This retrospective study aims to determine the prevalence of PT dislocation in association with calcaneal fractures at a single institution and describe systematic steps to avoid missed diagnosis at each stage of management.

Methods: CT scans of all patients with calcaneal fractures from the Picture Archiving and Communications System (PACS) from 2010 were systematically reviewed. The senior author and a Musculoskeletal Radiologist analysed the images for concomitant dislocation or subluxation of the PT's, utilizing criteria as defined by Ho et al. Further to this we included patients who sustained calcaneal fractures with associated PT dislocation prior to June 2010 and were referred either for primary open reduction or later with post-traumatic osteoarthrosis of the subtalar joint.

Results: Over three years and nine months beginning in June 2010, 71 calcaneal fractures were identified on PACS. 15 of those had associated subluxation or dislocation of the peroneal tendons either on CT scan or at surgery (21%). 10 of our 71 patients exhibited a fleck sign on plain anteroposterior ankle x-ray (14.1%) suggesting potential avulsion of the superior peroneal retinaculum. The combined cohort comprised 28 patients, 23 men and 5 women, aged 21 to 82 years (average, 46.3 years). 22 (79%) of PT dislocations were not recognised at the original injury. In six patients undergoing operative fixation, five (83.3%) had dislocated PT's noted on CT scan. In one case (16.7%) the peroneal tendons were clinically dislocated.

Conclusion: The PT dislocation rate in this paper is comparable with the literature. Patients should undergo careful clinical examination, radiological assessment with x-ray and CT followed by probing at surgery to ensure the diagnosis is not missed.

FP24

Plantar plate imaging - correlating ultrasound arthrography and surgical findings

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Introduction: Instability and synovitis of the lesser metatarsalphalangeal (MTP) joints is a significant cause of forefoot pain. Plantar plate imaging traditionally has been through MRI and fluoroscopic arthrography. We have described ultrasound arthrography as a less resource-intensive technique without radiation exposure. We report the correlation between ultrasound arthographic and surgical findings.

Methods: Patients with lesser MTP joint instability and pain underwent ultrasound arthrography by a consultant musculoskeletal radiologist. The main finding was the presence of a full or partial tear of the plantar plate. In some patients the location of the tear along with its size in the long and short axis was also reported.

Authors who were not involved in the imaging or surgery reviewed the operation notes of patients who underwent surgery to identify

· Whether a partial or full thickness tear was identified
· Size and location of the tear

The accuracy of ultrasound arthrography was calculated using surgical findings as the standard.

Results: 53 patients with 55 joints underwent ultrasound arthrography, and of these 34 went on to have surgery. 23 patients had adequate documentation of surgical and ultrasound findings. Surgery confirmed plantar plate tears in 21 patients (91.3%) with 9 full thickness tears and 7 partial thickness tears confirmed both operatively and with ultrasound (in 5 patients the operation note did not specify completeness of tear). In 2 patients, in whom ultrasound demonstrated a partial thickness tear, no tear was found at surgery. The sensitivity of ultrasound arthrography for plantar plate tears is 100%, specificity is 0% (although based on few patients), and positive predictive value of 91.3%.

Conclusion: Ultrasound arthrography has a high sensitivity, but low specificity for plantar plate tears, comparable with ultrasound in previous studies. It allows differentiation of partial and full thickness tears which may be important for treatment.

FP25

An algorithm to assist the surgical decision making in the operative management of the cavovarus foot

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Introduction: The cavovarus foot is a complex deformity caused by muscle imbalance, soft-tissue contracture and secondary bony abnormality. It is a combination of hindfoot, midfoot and forefoot deformity and the decision making process for surgical management can be difficult. The process of deciding which combination of procedures is required is often poorly understood. We present an algorithm to assist with this decision making.

Methods: We have analysed a single surgeon's experience of cavovarus foot correction, from a consecutive series of 50 patients over 5 years, to develop an algorithm to guide operative decision making. Cases included cavovarus deformity secondary to cerebral palsy, Friedreich's ataxia, Charcot Marie Tooth disease, post-traumatic contracture, post-cerebrovascular accident, iatrogenic post-surgery and physiological cavus. We have taken a systematic approach to each component of the deformity in order to generate the algorithm.

Results: To assist in rationalising the traditional 'a-la-carte' approach, our algorithm describes what we believe are the indications for a variety of surgical interventions, including soft tissue contracture release, osteotomies of the hindfoot, midfoot and forefoot, tendon transfer and soft tissue balancing, and arthrodesis. We detail the decision making process for each surgical option and give the reasons for each decision. We have also reviewed the available literature on this topic, to produce an evidence-based and useable tool for surgical planning.

Conclusion: The surgical decision making process in the management of the cavovarus foot is complex. We believe that this algorithm, based on extensive personal experience and up-to-date published evidence, provides a clear and proven framework on which surgical decision making can be guided and justified.

FP26

Minimally invasive calcaneal osteotomy; a safe alternative to open calcaneal osteotomy with fewer complications

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Background: Calcaneal osteotomy is an established technique in correcting hind foot deformity. Patients have traditionally received an open osteotomy through Atkins lateral approach. In order to reduce the rate of wound complications associated with the Atkins approach, a minimally invasive surgical (MIS) technique has been adopted since 2011. This uses a low-speed, high-torque burr to perform the same osteotomy under radiographic guidance. The results of the new MIS technique, including post-operative complication rates, are compared to the standard open approach.

Methods: The safety of the new MIS technique was investigated by conducting a case controlled study on all patients who underwent displacement calcaneal osteotomy at the Nuffield Orthopaedic Centre, Oxford from 2008 to 2014. The primary outcome measure was 30 day post-operative complication rate. Secondary outcome measures included operating time, duration of stay, fusion rates and amount of displacement achieved.

Results: 82 patients underwent calcaneal osteotomy as part of their corrective surgery; 50 patients in the Open approach group and 32 patients in MIS group. The average age at the time of surgery was 47.7 years (range 16-77) for the Open group and 48.5 (range 21-77) in the MIS group. A mean calcaneal displacement of 8.0mm (s.d. 1.32, 7 to 11 mm) and 8.33mm (s.d.1.53, 6 to 10 mm) was achieved through the MIS and open approaches respectively. There were significantly fewer wound complications in the MIS group (6.25%) compared to the Open group (28%, P=0.021) and the MIS group was associated with significantly lower rates of wound infection (3% versus 20%, P=0.043). Three patients in the Open group experienced sural peripheral neuropathy.

Conclusions: MIS calcaneal osteotomy was found to be a safe technique. It was as effective as calcaneal osteotomy performed through an open lateral approach but was associated with significantly fewer wound complications and fewer nerve complications.

FP27

Minimally invasive calcaneal osteotomies: are neurovascular structures at risk? A cadaveric study

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Introduction: There are concerns with the use of the Shannon burr in calcaneal osteotomies entered from the lateral side, with the medial structures possibly at risk when performing the osteotomy of the medial calcaneal wall. Our aims with this study were to investigate the neurovascular relationships with the calcaneal osteotomy performed using a Shannon burr.

Methods: This study was performed at the anatomy department, University of Sussex, Brighton. There were 13 fresh frozen below knee cadaveric specimens obtained for this study. The osteotomy was performed using a Shannon burr using a minimally invasive technique. The neurovascular structures were then dissected out to analyse their relation and any damage.

Results: Laterally, there was no evidence of damage to any neurological structure in 11 feet. In two feet, a very small lateral calcaneal branch was transected. In both cases, this was a very proximal branch from the sural nerve. There were between one and five lateral calcaneal branches of the sural nerve, and a very proximal branch present in nine feet. The minimum distance from the burr to the sural nerve was 9mm. In all cases, the entry point was within 6mm of the closest lateral calcaneal branch. Medially, there was no evidence of damage to any neurovascular structure. Quadratus plantae was present in 12 of 13 feet acting as a barrier to the neurovascular structures, and was not breached by the burr, shielding the neurovascular structures from injury. There were one or two medial calcaneal nerve branches, which all crossed the osteotomy, but were not damaged.

Conclusion: The calcaneal osteotomy performed by a Shannon burr can cause possible damage to small branches of the sural nerve, but is protected by QP form causing damage to any medial structures.

FP28

Outcome of distal metaphyseal metatarsal osteotomy (DMMO) for lesser toe metatrsalgia in a teaching hospital

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Introduction: The surgical treatment of intractable metatarsalgia has been traditionally been an intra-articular Weil's type of metatarsal osteotomy. In such cases, we adopted the option of performing a minimally invasive distal metaphyseal metatarsal ostetomy (DMMO) to decompress the affected ray. The meta-tarsophalangeal joint was not jeopardised. We present our outcomes of Minimally Invasive Surgery for metatarsalgia performed at our teaching hospital.

Material and methods: This is a multi-surgeon consecutive series of all the thirty patients who underwent DMMO. The sex ratio was M: F- 13:17. Average age of patients was 60 yrs. More than one metatarsal osteotomy was done in all cases. The aim was to try and decompress the affected rays but at the same time, restore the metatarsal parabola.

It was performed under image-intensifier guidance, using burrs inserted via stab incisions. Patients were encouraged to walk on operated foot straight after the operation; the rationale being that the metatarsal length sets automatically upon weight bearing on the foot. Outcome was measured with Manchester-Oxford Foot Questionnaire's (MOXFQ's) and visual analogue pain score (VAS). Minimum follow up was for six months.

Results: The average MOXFQ score was 26. Average improvement in the visual analogue pain score was 3.5. VAS deteriorated in three patients' whose pain got worse after surgery. Among these three, two had a further procedure on their toes. All of the patients experience prolonged forefoot swelling for at least 3 months.

Discussion: The most common complication after intra-articular ostetomy of the metatarsal head is stiffness of the metatarsophalangeal joint. We believe that using minimally invasive surgery with an extra-articular osteotomy, reduces the soft tissue injury to the joint, and therefore the amount of post-operative stiffness. In our cohort of patients, DMMO is associated with good patient satisfaction and low complication rates in the vast majority of cases.

FP29

The effect of the Cotton osteotomy on midfoot sag during reconstruction of adult acquired flatfoot deformity

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Introduction: The purpose of this study was to elucidate the specific radiographic effects that the Cotton osteotomy confers when used in combination with other reconstructive procedures in the management of the flexible flat foot deformity.

Methods: Between 2002-2013, 198 Cotton osteotomies were retrospectively identified following IRB approval. 131 were excluded on the basis of ipsilateral mid/hindfoot arthrodesis, inadequate radiographs or being less than 18yrs old at time of surgery. Parameters including the articular surface angles of the hindfoot/forefoot, Meary's angle and a newly defined Medial Arch Sag Angle (MASA) were recorded. A matched group of patients who did not undergo a Cotton osteotomy but who underwent similar hindfoot reconstructive procedures served as historic controls.

Results: 67 Cotton osteotomies in 59 patients with a mean age of 45 years (range, 18-80) were evaluated. Concomitant procedures included combinations of tibialis posterior tendon (PTT) reconstruction, Evans lateral column lengthening, medial displacement calcaneal osteotomy (MDCO).

In all patients who underwent a Cotton osteotomy, there were statistically significant improvements in the articular surface angles along the medial side of the foot ($p < 0.05$). Improvement in arch height was also found to be statistically significant ($p < 0.05$).

In comparison to matched controls, the Cotton osteotomy did not improve Meary´s angle but provided an additional 11.21° of MASA correction ($p < 0.05$) when used in in conjunction with the Evans procedure and PTT reconstruction. A similar trend was seen with MDCO and PTT reconstruction.

Discussion: This study confirms the Cotton osteotomy is a powerful surgical adjunct in flatfoot reconstruction and quantifies the additional 11.21° of MASA correction it provides when the Cotton osteotomy is added to a calcaneal osteotomy and PTT reconstruction. This has relevance as an alternative for selection of a medial column stabilization procedure, which is joint sparing.

FP30

Evaluation of acute charcot foot using SPECT/CT imaging

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Introduction: Charcot arthropathy is a complex condition affecting diabetic patients with neuropathy. Diagnosis of acute Charcot arthropathy particularly in absence of any perceptible trauma is very challenging as clinically it can mimic osteomyelitis and cellulitis. Delay in recognition of Charcot arthropathy can result in gross instability of foot and ankle. Early diagnosis can provide an opportunity to halt the progression of disease. We report the role of SPECT / CT in the early diagnosis and elucidation of the natural progression of the disease.

Methods: Our multidisciplinary team analysed the scans of neuropathic patients presented with acute red, hot, swollen foot with normal radiological findings (Eichenholtz stage 0), attending the diabetic foot clinic from 2009-2013.The patients were selected from our database, clinic and nuclear medicine records. Initial workup included the assessment of peripheral neuropathy, temperature difference, between the feet, serum inflammatory markers and weight bearing dorsoplantar, lateral and oblique x-rays. All patients had three dimensional triple Phase Bone Scan using 800Mbq 99mTc HDP followed by CT scan. Those patients with obvious radiological findings and signs of infection were excluded.

Results: We evaluated 193 scans in 189 patients. One hundred and forty nine patients showed increase in focal radionuclide uptake at ligament insertion or subchondral bone with a positive predictive value of 77 percent. Forty four out of 193 were negative for Charcot changes and they were not treated as Charcot. These patients did not develop any Charcot changes in the mean follow up of 8 months, indicating a clinically false positive rate of 23%.

Conclusion: SPECT/CT scan is a highly sensitive and specific tool for early diagnosis and accurate localisation of Charcot neuroarthropathy as clinical examination results in high false positive rate. SPECT/CT also helps to understand the natural progression of this disease.

FP31

Outcomes in acute Charcot neuroarthropathy - a single centre experience over 5 years

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The aim of this project was to look at time taken to achieve clinical resolution of diabetic charcot neuroarthropathy (CN) and to see if there was a correlation with location within the foot and overall outcomes.

A retrospective analysis of newly presenting acute CN patients between 2007 & 2012 was performed. Clinic records were examined to determine the site of the CN; total time treated in a TCC or other removable offloading devices; the presence of co-morbidities.

Fifty CN cases presented during this time. The mean age was 62.5±11.7 (SD) years. Eleven patients had type 1 diabetes mellitus (T1DM). The mean duration of diabetes was 29.7±12.9 years for T1DM, and 14.4±10.7 years for type 2 diabetics. All had palpable foot pulses & peripheral neuropathy at diagnosis. 82% had retinopathy; 34% had CKD stage 3-4. For the 42 patients who completed treatment, the mean duration was 53.9±28.0 weeks, of which a mean of 30.2±25.0 weeks was spent in a TCC. 23.7±16.2 weeks were spent in other offloading devices. Mean duration of treatment for forefoot, mid-foot & hind-foot was 47.2±22.6, 55.9±30.6 & 51.8±23.1 weeks respectively. Thirty-six patients were treated with TCC & other removable offloading devices, 6 were treated with one modality. Fourteen of the 36 (38.9%) required re-casting. Eight patients did not complete treatment: 4 underwent below knee amputation, 2 died, 2 were still undergoing treatment.

In our cohort the mean length of treatment is dependent on the position of the CN. The mean time to resolution is just over 1 year. However, a high percentage (38.9%) deteriorated after coming out of a TCC. This study highlights the need to develop more precise measures to help manage acute CN.

FP32

Arthroscopic ankle fusion for avascular necrosis of the talus; a case series

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Background: Avascular necrosis (AVN) of the talus is a painful condition caused by trauma, steroids, alcoholism and haematological disorders. It is difficult to treat and at present there is insufficient evidence in favour of any particular strategy. The aim of operative therapy should be to relieve symptoms, maintain the normal architecture of the talus and treat associated arthritis. Small case series have described early core decompression, retrograde tibiotalocalcaneal arthrodesies and open tibio-calcaneal arthrodesis. Open procedures risk further talar collapse by disrupting its blood supply, and tibiotalocalcanal fusion sacrifices both the ankle and subtalar joints. The hypothesis is that arthroscopic ankle fusion relieves symptoms of AVN talus while preserving the subtalar joint and preventing further collapse.

Methods: A case study was performed of 16 patients with AVN who underwent arthroscopic ankle fusion at the Nuffield Orthopaedic Centre, Oxford, UK between 1998 and 2012. Clinical notes, radiographs and MRI was used to investigate the cause, co-morbidities and treatment outcomes following arthroscopic ankle fusion. Our primary outcome was fusion rate. Secondary outcomes included peri-operative complications, ongoing pain and subsequent operative intervention.

Results: The average age at the time of operation was 53.5 years (range 17 to 69). The presumed causes of AVN talus were steroids (3 patients), trauma (3 patients), haematological (2 patients), and alcoholism. The aetiology was unknown in 7 patients. Clinical and radiological fusion at the ankle joint was confirmed in 14/16 patients (2 were followed elsewhere). 11 patients were satisfied with the result at discharge, reporting no post operative complications. 3 patients had ongoing pain. 2 patients reported metalware irritation. 2 patients underwent a subsequent subtalar fusion.

Conclusions: Arthroscopic ankle fusion is a safe and reliable treatment of symptomatic AVN talus. It is a minimally invasive procedure potentially improving blood supply to the the talus and sparing the subtalar joint.

FP33

Is bone allograft the right choice for tibio-talo-calcaneal fusions using the hindfoot nailing system? Nottingham Hospitals' Experience

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Introduction: This study presents a series of 64 patients undergoing tibio-talo-calcaneal (TTC) fusions with a hindfoot nail to compare the times to union and complications comparing use of allograft with no allograft.

Methods: We conducted a retrospective review of patients undergoing a TTC fusion with a hindfoot nail from a period from 2010 to 2013. A total of 64 patients were collated which were performed by 3 surgeons across two centres.

We reviewed the medical notes to determine the complications associated with the procedures and the radiographs to assess the time to clinical/radiological union. A comparison between the patients who had undergone a TTC fusion with allograft versus patients who had not received any allograft was made.

Results: Within our group, n = 15 (23%) patients had allograft utilised and n= 49 (77%) patients underwent TTC fusion without allograft.

Within the allograft group, the mean time to union was longer and the complications included deep infection n= 2 (13%), prominent metalwork n=2(13%). The mean number of operations per patient was 1.33. Within the group not receiving allograft, the mean time to union was shorter than that of allograft group and the complications noted were fracture n=1 (2%), prominent metal work n= 1 (2%) & non-union n= 5 (10%), with the mean number of operations per patient being 1.18.

Conclusions: In our study we have found that patients undergoing TTC fusion with bulk allograft had longer times to union with a higher rate of complication p =0.22 and increased number of surgeries. When managing patients with bone loss, the benefits of utilising allograft to maintain limb length versus the longer time to union and increased rate of secondary surgeries needs to be balanced, but appears justified in our series.

FP34

Assessment of smoking status in patients undergoing foot and ankle surgery

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Introduction: Wound healing and poor bone healing are complications seen in patients who smoke and some surgeons prefer not to operate on smokers. However, self reporting of smoking by patients may be biased. This study compares self-reporting of smoking habits and cotinine levels in the urine of our patients.

Method: 77 patients admitted for an osteotomy or arthrodesis procedure between September 2013 and May 2014 agreed to participate in this study. A questionnaire was completed and a urine sample was obtained and tested for cotinine, a metabolite of nicotine, by 2 techniques: a dipstick, the COT One Step Cotinine Test, yielding a positive result when the cotinine in the urine exceeds 200 ng/mL and the Concateno laboratory assay test, providing a mean value to give a qualitative reading whereby the cut off for non-smokers is 500ng/ml.

Results: Questionnaire results showed that 12 participants were active smokers, 35 classed themselves as ex-smokers and 30 were non-smokers. A dipstick result was negative in all the non-smokers, in 31/35 (89%) of the ex-smokers and in 4/12 (25%) of the current smokers. The dipstick test was positive in 4 self-reporting ex-smokers and only 8 of the 12 current smokers. The laboratory assay gave readings from 21 to 45,657 with higher readings being from heavier smokers. It correctly gave a value < 500 for all self-reporting non-smokers but 3 of the 35 self-reporting ex-smokers had a value between 500-5000ng/ml.

Conclusion: Whilst the majority of our patients had matching self-reporting smoking status and urine cotinine levels, 10% of self-reported ex-smokers had a high level of urine cotinine due to the test limitations or reporting bias by our patients. The £1.50 COT dipstick test is a cheap and easy way to correctly confirm a non-smoker compared to the Concateno laboratory assay which costs £7 excluding portering costs.

FP35

Vitamin D deficiency and non-union in foot and ankle surgery

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Introduction: Vitamin D plays an important role in bone turnover. Deficiency (including borderline deficiency, or insufficiency) has a known association with fractures and has been linked to delayed or non-union of fractures. We therefore routinely test vitamin D in cases of non-union. Noting a high rate of vitamin D deficiency in this group, we instituted a policy to routinely screen for and treat vitamin D deficiency in both post-operative and pre-operative patients. We hypothesised that, in the post-operative patients, levels would correlate with rates of union.

Methods: We sent serum vitamin D levels on consecutive post-operative patients seen in clinics between January and May 2014. They included those with an arthrodesis of the ankle, triple joint or first MTPJ. Union was deemed to have occurred when the patient was comfortable full weight bearing and radiographs showed trabeculae crossing the fusion site. Non-unions were all confirmed with computed tomography.

Results: Ten patients were treated for non-union, and had a mean serum vitamin D of 58nmol/L. Fourteen patients (collected over a shorter time period) had confirmed union, with a mean vitamin D of 90nmol/L. This was statistically significant on a one tailed Student's t test ($p=0.038$). Vitamin D was deficient in five (50%) of non-unions and in three (21%) of unions, giving an odds ratio of 3.67.

Conclusions: Our early results show a significant association of serum vitamin D levels with likelihood of non-union, and we continue to collect data. There is a high prevalence of vitamin D deficiency in our patient population. This is of concern both for the outcome of their surgery and for their lifetime fracture risk. We recommend either screening for or presumptively treating vitamin D deficiency.

FP36

Comparison of microbiology cultures from deep tissue biopsies compared to superficial swabs from infected diabetic ulcers

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Introduction: Diabetic ulcer superficial swab cultures have a low specificity for guiding antibiotic treatment. Some studies have recently re-assessed and advocated the role of superficial swabs. We have performed an analysis of microbiology results in patients with infected diabetic ulcers to further appraise the need for using deep tissue cultures as a guide for antimicrobial treatment.

Methods: We reviewed 23 consecutive diabetic patients in 2013. All patients underwent investigation and treatment by the Orthopaedic department for deep, intractable diabetic ulceration. Microbiology culture results from superficial swabs were compared to deep tissue and bone biopsies.

Results: The mean numbers of isolates from soft tissue and bone biopsies were 2.1 and 1.8 respectively (range 1-4). The most prevalent organisms seen in deep samples were anaerobes (9 patients), Staphylococcus aureus (8 patients) and entrococci (4 patients). In superficial swabs, 74% cultured non-specific, mixed skin flora and enteric species. The remaining 6 patients cultured Staphylococcus aureus alone (1), with Steptococcus (2), Pseudomonas (2) and MRSA (1). All 23 soft tissue biopsies were culture positive, 19 bone biopsies were positive of which 14 grew the same organisms of soft tissue cultures. In deep tissue/ bone biopsies, 13/23 patients cultured specifically organisms that were seen non-specifically in superficial swab cultures. However, in 10 patients deep tissue specimens, grew organisms that were not cultured from superficial swabs with 6 of these being anaerobes.

Conclusion: We have shown that in 43% of cases, deep tissue cultures isolated organisms that were not grown by superficial swab cultures. In 26% of these cases the organism was an anaerobe favouring deep, low oxygen tension environments. We refute recent evidence claiming the value of superficial swabs. We implore physicians treating patients with these ulcers to refer to an Orthopaedic surgeon to perform deep tissue biopsies and treat according to their culture results.

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POSTERS ABSTRACTS

P1

The effect of different intermetatarsal angles upon first metatarsophalangeal joint stress: a finite element study

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Introduction: Osteoarthritis (OA) of the first metatarsophalangeal joint (MTPJ) is the most common form of degenerative joint disease in the foot, affecting 35-60% of adults over 65 years (Wilder et al., 2005). Different foot structures have been associated with an increased incidence of OA of the first MTP joint (Hillstrom et al 2014). An increased Intermetatarsal Angle (IMA) is a common deformity of the foot, but its relationship to joint stress of the first MTP joint and subsequent development of osteoarthritis remains unknown. The aim of this study is to assess how an increased intermetatarsal angle affects the joint stress of the first MTP joint, using finite elemental analysis.

Methods: Radiological images of an asymptomatic 55 year-old male were acquired and segmented to create accurate 3D representations of the hallux. These were then exported to ABAQUS V6.12-2 (HKS, USA). Vertical forces of 110 N and 150 N were applied to the distal phalange and the sesamoid bones, respectively, to simulate propulsion (Hillstrom et al., 2013). The model was then modified with virtual IMA, ranging from 7° to 30°, to acquire peak stress measurements in the first MTPJ.

Results: The model, simulating a well-aligned toe, had a peak stress value of 1.11 MPa in the proximal phalange cartilage and 0.89 MPa in the first metatarsal cartilage. Compared to the well-aligned toe, IMA angles of 15°, 20°, 25° and 30° resulted in an increase in peak stress by 20.79%, 155.9%, 326.4 and 391.1%, respectively, in the proximal phalange base cartilage, and 67.4%, 189.2%, 307.1% and 362.1%, respectively, in the first metatarsal head cartilage.

Conclusion: This study indicates a substantial rise in peak joint first MTPJ stress as the IMA of the foot increase. This could help surgeons make informed decisions on addressing IMA deformity before the onset of osteoarthritis.

P2

Finite element modelling of radial shock wave therapy for plantar fasciitis

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Introduction: Therapeutic use of shock wave therapy is emerging as a method of choice when treating persistent cases of plantar fasciitis. In spite of the apparent effectiveness and widespread use, the understanding of the mechanisms through which shock waves promote healing is unclear. The aim of this study to gain a better understanding of the mechanical stimuli that this method produces using computer modelling.

Methods: Finite element models of a shock wave source and of the foot were constructed to simulate shock wave therapy. The model of the shock wave source was based on the geometry of an actual radial shock wave device. The foot model was based on the geometry reconstructed from MRI images of a volunteer. Simulations were conducted of a single and of two successive shock wave pulses administered to the foot.

Results: A standing stress wave is generated in the applicator of the device using ballistic method. This wave is transmitted into the soft tissue in the form of pressure waves that propagate in all directions. The magnitude of the pressure generated at the surface of the soft tissue is up to 8.5 MPa, which is consistent with published data from in-vitro experiments. The negative pressure at the plantar fascia reaches values of over 1.5 MPa, which should be sufficient to generate cavitation in the tissue. The results also show that multiple shock wave pulses may have a cumulative effect in terms of strain energy in the foot.

Conclusions: The results support the hypothesis that cavitation-induced micro-trauma leading to neo-vascularisation may be one of the mechanisms that enhance the healing process. Energy accumulation from successive shock wave pulses has not been mentioned before and it may point to a potential new healing mechanism.

P3

Does the size of Morton's neuroma predict early failure of corticosteroid injection and the need for surgery?

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Introduction: Corticosteroid injection is one of the standard interventions in the management of Morton's neuroma (MN). Published literature has suggested that corticosteroid injections were less efficacious in larger lesions. The purpose of this study was to investigate whether the size of the neuroma was also a predictor for early surgery.

Methods: The hospital database was used to identify all patients that had received an ultrasound-guided corticosteroid injection for MN between Jan 2009 and Sept 2013. Theatre records were then checked to identify cases that had subsequently undergone surgical excision of the neuroma. A comparative analysis was performed between the patient groups that had surgery with those who did not.

Results: A total of 110 feet were treated with corticosteroid injections for MN. Male to female ratio was 1:4 with a mean age of 55 years. Both feet were equally affected and 10 patients had bilateral involvement. 32 feet had ipsilateral neuromas; 23 of which were symptomatic.22 feet had undergone surgical excision of the neuroma (20%) at a mean follow-up of 27 months (6- 62 months) following the injection. The mean time lag between injection and surgery was 20 months (4- 49 months). Binary logistic regression analysis was performed adjusting for age, gender, size of neuroma and presence of ipsilateral neuromas. The size of MN was not a predictor for subsequent surgery (10.7± 3.2mm in surgical group vs. 10.1± 3.9mm in non-surgical group; p=0.319). Younger patients (< 50 years) had a higher rate of requiring surgical excision after treatment with injection.

Conclusion: Twenty-percent of MN treated with corticosteroid injections required surgical excision at an average follow-up of 2 years. There was no relationship between the size of neuroma and the need for subsequent surgical excision. Age (< 50 years) was the only predictor for surgery.

P4

Single-photon emission computed tomography in painful total ankle replacements

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The use of Single-photon emission computed tomography (SPECT) imaging in foot and ankle surgery has been developing over recent years. Its use in identifying unexplained pain in the foot and ankle has been described, where other imaging modalities have failed. The investigation of a painful TAR is difficult, often not delineating a definitive cause. Our aim in this study was to investigate the use of SPECT imaging in painful TARs.

Methods: We performed a retrospective analysis of SPECT imaging, performed for painful TARs in our department between October 2010 and March 2014. Clinical information was gathered from the patient's notes and all other relevant imaging was reviewed for the presented cases.

Results: There were 15 patients identified who had undergone SPECT imaging for a painful TAR. The mean age was 63.1 years, with a male/female sex ratio of 2:3 and a minimum time of surgery to imaging of 18 months. Of the 15 patients, 14 were positive for increased osteoblastic activity in relation to the periprosthetic area, in keeping with implant loosening. The most common finding was tracer activity in relation to the talar component in 13 cases. Tracer activity localized to the tibial component in 5 cases. In all but 1 case (where the tracer to the tibial component alone), there was no evidence of loosening on the plain radiographs. Infection was ruled out by using Indium labeled white cell scan in addition.

Conclusion: The SPECT scan was very useful in identifying aseptic loosening in painful TARs, which was not seen on other imaging modalities. The talus was the most common site for loosening. Because of the curvature of the talus, diagnosis of loosening is most challenging with other imaging modalities, including CT. The scan cannot however rule out infection, and therefore additional investigations are required.

P5

Is there a need for prophylactic antibiotics in lesser toe fusion surgery using K-wires? A prospective randomised controlled trial

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Problem: K-wires are commonly used in lesser toe fusion surgery. A recent survey of British Orthopaedic Association members has demonstrated lack of consensus on the use of prophylactic antibiotics for this procedure. There is paucity of evidence-based guidelines on this subject and the decision depends on the surgeon's individual preference.

Design: Prospective randomised controlled trial.

Material and methods: 100 adult patients undergoing toe fusion surgery that required K-wires to be left in-situ for 4-6 weeks were randomly allocated into those who received prophylactic antibiotics (Group 1, n=48) and those who did not (Group 2, n=52). Patients were followed up regularly and during each visit K-wire insertion sites were investigated for signs of pin tract infection according to the modified Oppenheim's classification. The regional ethics committee approved the study.

Results: The mean age of Group 1 was 58.0 (SD 17.5) and Group 2 was 62.7 years (SD 14.7). Group 1 had four (8.3%) and Group 2 had two (3.8%) patients with Diabetes. Three patients (6.8%) in Group 1 and one patient (1.9%) in Group 2 developed signs of infection, which required treatment by oral antibiotics. None of the patient required premature removal of k-wire. There were no features suggestive of osteomyelitis in any of the patients.

Conclusions: This study demonstrates that overall infection rate in lesser toe fusion surgery is low and using prophylactic antibiotics does not reduce the incidence. There is a risk that inappropriate use of antibiotics may contribute to the development of antibiotic resistance and it adds to healthcare costs.

P6

A modern biothesiometer compared to the gold standard

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Introduction: Current screening methods for the detection of neuropathic limbs include, history and clinical examination coupled with specific tests. The current gold standard as quoted by NICE guidelines is to test patients with diabetes annually using a 10g Semmes-Weinstein monofilament. This study compares a standardised vibration function on a mobile phone (biothesiometer) against a 10g monofilament and a tuning fork, in the detection of diabetic peripheral neuropathy.

Methods: The study was conducted in outpatients at Chesterfield Royal Foundation Trust. The study comprised of a control group of patients, a group of medically well patients with a lower limb injury and a group of patients with peripheral diabetic neuropathy. Patients completed a questionnaire on their medical history and were tested with a 10g monofilament, a tuning fork and the vibration function on the iPhone 4S using the NeurAppathy App. Patients had several points of skin tested. Finger pulp, patella, lateral and medial malleoli, heel, 1st and 5th metatarsal heads.

Results: 61 patients were recruited to this study, 21 control, 19 lower limb injury and 21 to the neuropathy groups. The control group could feel 420 of 441 tests(95%), the injury group could feel 349 of 399 tests(87%) and the neuropathy group could feel 216 of 441 tests(48%) $p < 0.001$. The most accurate location was the head of the first metatarsal at 0.86. The accuracy of the tuning fork was 0.77, monofilament 0.79 and the modern biothesiometer 0.88.

Conclusion: The modern biothesiometer is an accurate test in the screening of diabetic peripheral neuropathy. This study suggests that the most accurate of the locations tested is the 1st metatarsal head. An injury to the lower limb does affect the patients sensation so screening should be done on the contralateral limb.

P7

Outcomes for low intensity pulsed ultrasound devices for achieving union in established non-unions following elective surgery in the foot and ankle

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Introduction: National Institute for Health and Clinical Excellence (NICE) in January 2013 approved the use of low intensity ultrasound devices for the conservative treatment of fractures with delayed or established non-union. Coughlin et al have show the benefit following subtalar arthrodesis at successfully improving union rates even in those patients predicted to be high risk of a nonunion.

The aim of our study is to report the outcomes of the use of low intensity pulsed ultrasound on union rates in elective foot and ankle surgery.

Methods: A retrospective review of all patients treated with low intensity pulsed ultrasound (EXOGEN ultrasound bone healing system) following established nonunion. Patient demographics, original diagnosis, treatment, length of non-union, time to union and any complications were recorded. Data were analysed in excel.

Results: Thirteen patients were identified, 8 male and 5 female, mean age 54 (range 39-73). Forty-six percent of patients smoked. Mean length of non-union prior to application of EXOGEN was 11 months (range 5-20 months). Nine patients successfully achieved union, with a mean time to clinical and radiological union of 4.6 months after application of the EXOGEN (range 2-8 months). Four patients failed to achieve union with the EXOGEN giving a 31% reoperation rate. Of those requiring revision surgery, there were 3 subtalar fusions, which failed to heal and 1 MTPJ fusion, which had failed to unite. All have subsequently healed following revision surgery with bone graft. There were no complications relating of the use of the EXOGEN device.

Conclusion: Reported non-union rates of 0-36% for subtalar and triple arthrodesis highlight that challenge in managing non-unions. This study shows that there is an increasing role for the use of low intensity pulsed ultrasound as a safe and effective adjunct to achieve clinical and radiological union in established non-unions and avoiding revision surgery.

P8

Trifocal osteotomy for the correction of severe hallux valgus deformity

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Introduction: Hallux Valgus is a complex deformity. Symptomatic Hallux Valgus (HV) can be treated with metatarsal osteotomy combined with proximal phalangeal osteotomy. This configuration may be suitable for the moderate deformities. However, it might not be enough to treat severe deformities. We present our series of patients treated with tri-focal osteotomies to correct severe HV deformities.

Methods: We treated patients with severe HV deformity using trifocal osteotomies- basal 1st metatarsal osteotomy, distal 1st metatarsal chevron osteotomies and proximal phalangeal Akin osteotomy. Our outcome measures included—radiological values and validated Patient-Reported Outcome Measures- EQ-5D and Manchester Oxford Foot Questionnaire (MOxFQ) scores, as a part of PROM 2.0 DoH national initiative.

Results: Our study group consisted of eleven patients with 14 operated feet (three bilateral), with a mean age of 60.3 (45.1-82.9) years. The mean pre-operative Hallux Valgus Angle of 48.4° (38°-53.3°) was corrected to 16.5° (8°-28°). The Inter-Metatarsal Angle was corrected from mean 19.7° (13.5°-27.2°) to 7.8° (6- 10.2°). Inter-Phalangeal Angle was corrected from mean 10.6° (7°- 17.4°) to 7.6° (4°- 10°). There were no wound problems or non-unions. The mean follow-up was 9 (6-12) months.

Descriptive Index component of EQ-5D rose from median score of 0.635 (0.089-0.72) to 0.74 (0.42-1.0), wherein score of 1.0 indicates the best possible health. The EQ-5D Visual Analogue Score rose from median of 53.8 (15-80) to 88 (75-98), where-in 100 is the best score.

All three components of the MOxFQ score also improved (100 is the worst score); Forefoot pain (from 73.6 to 40), Walking and Stability (52.4 to 31), and Social interaction (65.1 to 40.7).

Conclusion: Trifocal osteotomies are safe and can provide a good correction of severe HV deformities with high patient satisfaction and no procedure related complications.

P9

Lower limb venous blood flow with ankle joint immobilisation

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Below knee cast immobilisation is associated with the development of deep vein thrombosis secondary to venous stasis. The effect of weightbearing in a below knee cast or pneumatic walking boot on lower limb venous blood flow was investigated.

Blood flow was measured from the popliteal vein of the right leg in ten healthy volunteers during non-weightbearing and weightbearing exercises before and after ankle joint immobilisation.

There was no significant reduction in venous blood flow measurements when fully weightbearing in a neutral cast or pneumatic walking boot compared with full weightbearing without immobilisation. However, a significant reduction in venous blood flow was observed whilst full weightbearing with the ankle immobilised in equinus and with partial weightbearing exercises (50% body weight).

These results suggest that cast immobilisation alone should not be regarded as a risk factor for the development of deep vein thrombosis without an appreciation of the position of the ankle joint and weightbearing status.

P10

Histological evaluation of calcaneal tuberosity cartilage - a proposed donor site for osteochondral autologous transplant for talar dome osteochondral lesions

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Osteochondral Autologous Transplant (OATs) as a treatment option for Osteochondral lesions (OCLs) of the talar dome frequently uses the distal femur as the donor site which in some cases is associated with donor site morbidity. Some studies have described the presence of hyaline cartilage in the posterior superior calcaneal tuberosity. We aimed in this cadaveric study to histologically evaluate 12 osteochondral plugs taken from the posterior superior calcaneal tuberosity and to compare them to 12 osteochondral plugs taken from the talar dome.

In the talar dome group, all samples had evidence of hyaline cartilage with varying degrees of GAG staining. The average hyaline cartilage thickness in the samples was 1.33 mm. There was no evidence of fibrocartilage, fibrous tissue or fatty tissue in this group. In contrast, the Calcaneal tuberosity samples had no evidence of hyaline cartilage. Fibrocartilage was noted in 3 samples only. We believe that the structural differences between the talus and calcanium grafts render the posterior superior clancaneal tuberosity not a possible donor site.

We conclude that we were not able to demonstrate a suitable donor site from the calcaneal tuberosity for OATs in OCL of the talus.

P11

Trainer vs trainee: clinical outcome of primary total ankle replacement. Can learning curve be included during training?

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Introduction: Total Ankle replacement (TAR) is technically demanding; has a shallow learning curve with best results being achieved with the surgeons´ experience. Complications appear to be a function of the surgeon's familiarity with the procedure. Learning curve can significantly be improved if senior trainees or fellows are given opportunities to perform this procedure during their training.

Aim: To investigate whether learning curve could safely be introduced within the training rotation.

Methods: A prospective study of 149 TAR was undertaken to investigate an association between surgical outcome and the grade of the operating surgeon. We had two distinct groups comparing the senior surgeon series (110) against the trainee series (39). The primary outcome measure was the change in the AOFAS scores. Secondary outcomes included the rate of revision and length of hospital stay.

Results: All scores improved at one year in both the groups including AOFAS, WOMAC,SF-36 and satisfaction scores. No significant difference was noticed in AOFAS scores) (p=0.176), length of stay (p=0.08) or complication rates (p=0.076) between thetwo groups. The incidence of intra-operative fractures was higher in trainee group (4/39;10.25%) compared to senior surgeon series (2/110; 1.85%). There were five revisions in traineeseries, two for deep infection, two for instability and one for aseptic loosening. This wassignificantly higher (12.8%, p=0.005) compared to senior surgeon series (1.8%).

Conclusion: The outcome observed in our trainee series is comparable to the published resultsof TAR during the surgeon's initial learning curve. The study provides the evidence that TAR can safely be performed by appropriately trained surgeons in training. A closed senior supervision is vital during the initial learning curve to improve surgical technique and the outcome. The trainees however should not be allowed to perform complex TAR until they are experienced to reduce the revision rate.

P12

Can we safely broaden the indications for total ankle replacement?

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Introduction: The recommended indications for total ankle replacement (TAR) are limited, leaving fusion as the only definitive alternative. As longer-term clinical results become more promising, should we broaden our indications for TAR?

Methods: Our single-centre series had 130 Mobility TARs with minimum 36 months' follow-up.They were divided into two groups. 'Ideal' group included patients with all of the followingcriteria: age >60y, BMI < 30, talar tilt < 10º, non-diabetic and non post-traumatic osteoarthritis(PTOA). 'Complex' group included patients without any of these criteria. We compared AOFAS scores, patient satisfaction, patient-reported outcome scores and complications between both groups.

Results: Overall, there were significant improvements in AOFAS ($p < 0.001$), WOMAC ($p < 0.001$) and SF-36 scores ($p < 0.001$) from pre op to one year and at three years for the whole group. Significant mprovements were seen in the following fields: physical function, role physical, bodily pain (p=0.000), vitality (p=0.015) and social function (p=0.043). No significant difference was seen in scores from pre-op to three years between two groups based on age, diagnosis, BMI, Diabetic status and difference in talar tilt. Patients > 60y reported better satisfaction with pain relief (p=0.005) at one year. Patients with BMI less than 30 had significantly better satisfaction scores for return to activities of daily living (ADL) at one year (p=0.005). Younger (age < 60 years; p=0.014) and slimmer patients (BMI < 30;p=0.018) had significant overall satisfaction scores at one year. At three years from surgery, no significant difference was seen in any of the subgroups ($p > 0.005$)

Conclusion: The results of univariate analyses showed that diabetic status, talar tilt, age, BMI and diagnosis did not have any significant effect on outcome scores from pre-op to three years(p>0.05). We believe the indications for TAR can be widened safely in all the subgroups without further morbidity.

P13

A systematic review investigating the incidence of venous thrombo-embolism (VTE) in foot and ankle surgery

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Introduction: The use of chemical prophylaxis against venous thrombo-embolism (VTE) following foot and ankle surgery is contentious. It is essential to understand VTE incidence in this group to make informed decisions regarding prophylaxis. We reviewed the literature to identify relevant studies and pooled the data to estimate VTE incidence.

Methods: A PRISMA compliant systematic review of the literature was performed using the AMED, EMBASE, HMIC, MEDLINE, BNI and CINAHL databases. All relevant studies were assessed using the CASP tool by two independent reviewers to exclude poor quality studies. Disagreement was resolved independently by the senior author. A narrative report of the results and meta-analysis of the relevant sub-groups was performed.

Results: The search gave 372 studies of which 52 were duplicates, in total 320 abstracts were reviewed. From this 28 papers were analysed with 6 excluded. Of the remaining 22 studies 8 were against prophylaxis, 7 for and 7 equivocal. The pooled results for studies using clinical assessment of VTE show an incidence of 0.7% (95% CI 0.5-0.9%) for no prophylaxis (n=87,888) and 2% (0.7-3.2%) for prophylaxis (n=18705). When VTE is assessed radiologically the incidence for no-prophylaxis (n=993) is 16.3% (9.9-22.7%) and the prophylaxis group (n=697) is 16.4% (7.6-25.2).

Discussion: There is a wide discrepancy between the rates of VTE depending on the method of assessment. Regardless of the assessment method chemical prophylaxis doesn´t appear to affect the rate of VTE. The rate of clinically apparent VTE following foot and ankle surgery despite not using prophylaxis is less than 1%. The background rate of VTE is estimated at 0.05% and risks from chemical prophylaxis include bleeding (1.95%) and Heparin Induced Thrombocytopaenia (0.2%). Overall study quality was poor and further randomised studies would be welcomed, however on the available evidence chemical prophylaxis for foot and ankle surgery cannot be recommended.

P14

Outcomes of people with diabetes admitted to hospital with ankle fractures - a single centre experience over 5 years

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Introduction: Ankle fractures are common injuries, with an incidence of 3.6:100/ year. Treatment protocols for ankle fractures are well established. However, despite previous data to show that people with diabetes are at greater risk of developing complications, including delayed bone-healing, impaired wound-healing and infection; no specific protocols exist for this group. The aim of this project was to look at complications of ankle fractures in patients with diabetes treated in hospital.

Methods: A retrospective analysis of patients presenting between 2008-12 with a diagnosis of diabetes and an ankle fracture treated in hospital. Clinic records were examined to determine the complications after ankle fracture treatment.

Results: 84 cases met the criteria of diabetes and ankle fractures. Seven patients were excluded because they were lost to follow up. The mean age at presentation was 67.4 year (SD 15.2). Twelve patients had type 1 diabetes. Mean HbA1C was 63 mmol/mol (SD 20.8). 36% of patients had CKD stage 3-4 and 4.5% CKD stage 5. Retinopathy was present in 25% of cases. However, our data showed almost no correlation between treatment time HbA1C, GFR, CKD, retinopathy, and age but only with different consultants.

59% of patients were treated with ORIF, the rest were treated with a cast. The mean duration of treatment until discharge from clinic was four months (SD 5.3).

A third of patients had a complication - 13 patients had wound complications; eight bone healing problems and one patient developed a charcot foot leading to a below knee amputation. Eventually, 94% of fractures healed (clinically or radiologically).

Conclusion: Our date confirm high complication rates in patients with diabetes who sustained an ankle fracture. Treatment time differed among orthopedic consultants which highlights the need for further research, in particular with a longer follow-up period, aiming to develop a diabetes specific treatment protocol.

P15

Modified Robert Jones procedure for managing clawing of lesser toes in Pes cavus

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Introduction: Pes cavus is a complex foot deformity in which surgical correction remains challenging. The literature offers no clear evidence on managing clawing of the lesser- toes in Pescavus.

Aim: To assess the long term functional outcome of modified Jones procedure for correction of lesser- toe clawing in pescavus.

Method: The surgical principles and techniques used were similar to those of the modified Jones procedure described for the great toe. Extensor tendons transferred to metatarsal neck and IP joint fused. We reviewed case notes and completed the Bristol Foot Score, the modified American Orthopaedic Ankle & Foot Society Mid-foot score, and a patient satisfaction questionnaire through telephone interviews.

Results: We treated lesser-toe clawing in 11 feet from 8 patients (5 women, 3 men). Mean age of the patients at the time of surgery was 30 y (range10 y to 58 y). Causes of pes cavus were Marfan syndrome, polio, spina bifida, spinal dysraphism, type 2 hereditary sensorimotor neuropathy and idiopathic. Mean duration of clinical follow up was 7 y (range, 6 months to 17 y). At the final clinical review, all 11 feet had good outcome. 6 feet had minor complications. The mean Bristol Foot Score was 27 and the mean Modified AOAFS Mid Foot Score was 76 indicating excellent results. Half of the patients had mild persistent foot pain but all were satisfied with the outcome.

Conclusion: Modified Jones Procedure for correcting lesser-toe clawing provides high patient satisfaction in spite of the few minor complications and late symptomatic relapses.

P16

Minimally invasive lesser toe surgery: a safe and effective alternative to open surgery

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Introduction: Minimally invasive forefoot surgery is thought to benefit patients over traditional open surgery with reduced soft tissue dissection and potential for faster recovery time and reduced soft tissue complications. There is limited data in the literature to support this claim for minimally invasive lesser toe surgery. We present a case series of consecutive patients undergoing minimally invasive lesser toe surgery and their post-operative outcomes.

Methods: 20 consecutive patients underwent isolated minimally invasive lesser toe surgery from 2011-2014, performed by the senior author (AS). Each patient completed a nurse specialist assisted Manchester-Oxford Foot Questionnaire (MOXFQ) and a visual analog scale for pain (VAS) pre operatively and 4-6 weeks post operatively. The average patient age was 68 years (range 34-91). All patients had local anaesthesia with minimal sedation if required.

Results: Mean MOXFQ scores were 34 (range 24-54) pre-operatively, and 7 (range 0-15) post-operatively. Mean VAS scores were 7 (range 4-8) pre-operatively, and 1 (range 0-2) post-operatively. No complications were identified at follow up.

Conclusions: Minimally invasive lesser toe surgery is a safe and effective alternative to open surgery. Although there is a learning curve to the use of minimally invasive surgical equipment, the benefits for the patient make this a worthwhile technique in lesser toe surgery.

P17

Uptake of paper patient related outcome forms in an orthopaedic department

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With one of the main factors of the 2013 'White paper Equity and Excellence' being transparency in outcomes, the collection of data may ultimately determine how a hospital is judged. As a foot and ankle department we have strived to collect patient related outcome (PROM) data on a consultant led paper based system for all referred patients with elective foot and ankle problems. This study aimed to assess the level of capture we achieved over a year period.

Methods: We analysed the outcome database and compared it to patient referrals and operations performed from June 2013 to June 2014. This data was compared to other surgeons within the department also collecting PROM data.

Results: There were 335 new elective foot and ankle patients presenting to the senior author. Of these, preoperative PROM data was collected for 327 (97.6%). Within the study period, 288 patients underwent surgery, although only 122 patients had reached 6 months follow up during the time studied. The 6 months PROM data collection was poor, with only 20 (16.4%) completing scores.

In comparison, two knee surgeons within the department who collect PROMS data on a limited number of procedures, have preoperative data collection of 100% and 91.1% with a consultant led paper based system. At 6 months their follow up data collection is 54% and 59% with a paper postal collection service.

Discussion: Isolated processes for the collection of PROM data are inefficient. Whether data is collected on all patients or on a limited amount of operations, data collection rates are poor, thus providing little meaningful data. The collection of data is important for reducing health inequalities, allowing international comparisons and is helpful for revalidation. We are now progressing to electronic capture and a more robust collection framework, for which additional human resources are essential.

P18

Minimally invasive surgery for early hallux valgus deformity: is metatarsal osteotomy required?

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According to NICE the available evidence on the use of minimally invasive surgery (MIS) for Hallux valgus is "limited and inconsistent".

The minimally invasive technique usually involves osteotomy of the first metatarsal in order to restore function and morphology to the first ray. This may not always be necessary.

Our aim was to determine the success of metatarsal-sparing surgery using MIS techniques, in cases with minimal or no subluxation at the first metatarsophalangeal joint (MTPJ).

A prospective audit was performed between May 2010 and August 2013 and included data for 24 consecutive MIS Bunionectomy & Akin procedures in 19 patients with a mean age of 34.8 years. Follow-up period ranged from 6 months to 44 months. Pre and post-op AOFAS scores were examined and radiological indices of inter-metatarsal angle (IMA) and hallux valgus angle (HVA) were compared. Tibial sesamoid subluxation was also recorded according to a documented measurement scale.

AOFAS scores increased from a mean of 59 (range 34-86) to a mean of 89 (range 74-100) ($p< 0.0001$).

Mean HVA decreased from 21 to 15 degrees ($p< 0.0001$) whilst mean IMA decreased from 12.3 to 9.4 ($p< 0.0001$). Tibial sesamoid position was also significantly improved.

There were no infections or non-unions. One patient required removal of prominent metalwork at 13 months.

This case series suggests that with careful patient selection, metatarsal osteotomy is not necessary for correction of hallux valgus if there is no significant subluxation at the metatarsophalangeal joint. The deforming forces of the flexors and extensors are corrected by the Akin osteotomy. Furthermore, these cases are technically less challenging to perform by MIS techniques and may be performed earlier in the surgeon's learning curve.

P19

The diabetic orthoplastics team: changing the paradigm in managing complex diabetic foot in the United Kingdom

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Introduction: The burden of complex diabetic foot disease, including Charcot arthropathy, is increasing. Results are often less than ideal, because the resultant tissue loss is difficult to treat, despite most UK centres having multidisciplinary diabetic foot teams. We report on our inpatient diabetic orthoplastics team (DOPT), which was set up, based on our existing complex trauma management model, to provide combined input in complex cases.

Methods: A retrospective review was performed of 24 months' inpatient activity since inception of the DOPT, using medical notes and a referral database compiled by the plastic surgeons. Referral indications and outcomes, including length of stay, were assessed.

Results: A total of 44 inpatients with 60 inpatient episodes were managed by the DOPT. The majority of referrals were either complex Charcot patients or those with post-operative, slow/non-healing wounds (32% and 31% respectively). 38% received a skin graft; 12% had combined orthopaedics/plastics procedures and 3% received microsurgical free flaps. A further 47% of the episodes received advanced wound management support. After the index procedure, 50% healed completely, while 30% remained stable or improved; a further 50% of these underwent a second procedure. The mean inpatient stay was reduced by eight days, compared to before the DOPT.

Conclusions: The DOPT facilitates wound management and surgical procedures in complex diabetic foot disease and adds in plastic surgical experience. We therefore suggest that tertiary care diabetic foot centres should consider the development of such teams.

P20

1ST MTPJ Arthrodesis using dome shaped reamers and low profile dorsal plate

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Introduction: Numerous methods exist for arthrodesis of the first metatarsophalangeal joint. K-wires, staples, plates and various combinations have all been used with varying fusion rates. We present the clinical and radiological results of arthrodesis of the 1st MTP using dome shaped reamers and a low contact profile titanium dorsal plate with interfragmentary screw.(Hallu-Fix).

Methods: Prospective study from April 2005 to March 2014. Patients were assessed clinically and radiologically. Pain scores, satisfaction survey, fusion rate and complications were recorded.

Results: 151 MTPJ fusions in 138 patients. 13 Bilateral, 12 revision fusions (tertiary referrals). 74 Right, 77 Left. 83 Female, 55 Males. Mean age 60 yrs range (29-85). Two developed non-union. One Deep infection requiring removal of metalwork and successful revision. 149 went on to fusion (98% fusion rate). Mean time to fusion 8 weeks, range (6 - 24). One developed CRPS settled at 3 months. One developed web space pain, settled with exploration and debridement. Four plate removals for prominent metalwork. Four minor numbness post op. Pain scores VAS, Pre-op Mean 8, range (6-10). Post-op Mean 2,range (0-4).

Conclusion: 1st MTPJ fusion with Hallu-Fix plate gives good results. The Hallu-Fix system of using dome shaped reamers and a low profile dorsal plate gives high fusion rates, stability and patient satisfaction. In most cases plate removal is not required. This technique is versatile, surgeon friendly and gives good fixation and reproducible results. We recommend its use.

P21

Predicting the outcome after ankle fracture fixation: what really is important? Six year follow-up of 182 patients operated on at a single centre

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There is paucity of data on long-term outcome of ankle fractures treated with surgery. The aim of this study was to assess variables affecting long-term outcome of this common injury treated with open reduction internal fixation (ORIF).

Patients who underwent ORIF of ankle fractures were identified using hospital logbooks. Pre-operative radiographs were reviewed to establish type of fibular fracture; involvement of malleoli; and syndesmotic injury. Post-operative radiographs were reviewed to identify adequacy of reduction with respect to restoration of fibular length and restoration of the mortise using Pettrone's criteria. The surviving cohort was sent Lower Extremity Function Score (LEFS), Olerud-Molander Ankle Score (OMAS) and a self-administered questionnaire at a minimum of six years after the fixation.

182 patients underwent ORIF in the study period. Male: Female ratio was 1:1 with an average age of 47 years. The majority of fibular fractures were Danis-Weber type B, followed by type C fractures (124, 54 respectively). Medial malleolus was involved in 63% of cases; greater than 25% of posterior malleolus in 24% of cases; and disruption of syndesmosis in 31%. The overall malreduction rate was 24% (10% had inadequate fibular length; 11% inadequate Pettrone's criteria; 3% were inadequately reduced based on both criteria).

Malreduction was associated with the development of radiographic osteoarthritis in 4 of the 44 cases.

The LEFS and OMAS scores showed a trend towards poor function with malreduction; however the scores were notably lower in patients who had presented with a fracture dislocation and in patients with posterior malleolar fracture.

The adequacy of the operative reduction does affect patient function. The severity of initial injury to the ankle, however, has a much more pronounced effect on a patient's long-term function irrespective of accuracy of reduction.

The findings of this study help in counselling patients about long-term prognosis of this injury.

P22

The long-term outcomes of forefoot surgery for rheumatoid arthritis patients

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Background: Painful forefoot deformities in patients with Rheumatoid Arthritis (RA) commonly need surgical corrections.

We report long-term results of patients undergoing forefoot surgery for RA; using Patient Reported Outcome Measures (PROMs).

Methods: This retrospective study involved consecutive patients with rheumatoid arthritis, who needed surgery for painful forefoot deformities. The data collection included demographics, type of surgery, medications for RA and, and the functional status. We used a Manchester Oxford Foot Questionnaire (MOxFQ), a validated PROM. The MOxFQ gives a score from 0-100; higher scores indicate poorer outcomes.

Results: This group included 19 patients, with 28 operated feet, with a median age of 54 years. Eighty-nine percent patients were on regular Disease Modifying Anti- Rheumatic Drugs (DMARDs). Surgical procedures included Stainsby procedure, MTPJ arthrodesis, Fowler procedure, Scarf, Akin osteotomies. At a median follow up of 6 (2-12) years, the median MOxFQ score was 78 (20-86) points, with better results in patients having surgery after 2008 than those before 2008 {28 (9-80), and 81 (65-87), respectively; p=0.02}. Superficial wound infection was noticed in two feet (7%), which settled with oral antibiotics. Twelve feet (43%) needed further operations for disease progression at a median time of 3 (1-5 years). None of the patients needed any re-operation for the primary surgery.

Conclusion: Surgery in forefoot deformities can provide a good long-term functional benefit in RA, with carefully controlled disease progression by judicious usage of the DMARDs. A multi-disciplinary team approach involving orthopaedic surgeon, rheumatologist and functional therapists is vital in these group of patients.

Day 1 Wednesday 5th November
Main Meeting Room(Auditorium 2)

08.00 **Registration** (Foyer) & **Coffee** (Exhibition Hall)

08.45 **Welcome to BOFAS 2014**
Stephen Bendall

09.00-10.30 **Instructional 1: TAR - Finding the Limits**

09.00 - 09.15 TAR and Extreme Deformity (lateral approach)
Charles Saltzman

09.15 - 09.30 TAR and Infection
Beat Hintermann

09.30 - 09.45 TAR: When it can be done and When should it be done?
Mark Glazebrook

09.45 - 10.00 Extreme TAR Revision - Sunil Dhar

10.00 - 10.30 Discussion and Questions

10.30-11.00 **Coffee** (Exhibition Hall)

11.00-12.30 **Free Papers**

12.30-13.30 **Lunch** (Exhibition Hall)

13.30-15.00 **Instructional 2: Old Problems, New tricks?**

13.30 - 13.45 The Dislocated MTPJ Plantar Plate Repair
Charles Saltzman

13.45 - 14.00 Treating Late Syndesmotic Instability
Mark Davies

14.00 - 14.15 Neglected TA Rupture
Joël Vernois

14.15 - 14.30 MI Heel Shift
Kartik Hariharan

14.30 - 14.45 New Hindfoot Tips and Tricks
Paul Cooke

14.45 - 15.00 Discussion

15.00-15.30 **Tea** (Exhibition Hall)

15.30-16.00 **Keynote Speaker**
Beat Hintermann
Ankle Arthritis: What Lies Beyond Replacement and Fusion

16.00-17.30 **Instructional 3: Heart-sink Cases in Foot and Ankle**

16.00 - 16.15 Dealing with The Infected TA Repair
James Calder

16.15 - 16.30 Iatrogenic Hallux Varus
David Redfern

16.30 - 16.45 The Iatrogenic Stiff Lesser Toe
Peter Lam

16.45 - 17.00 The Heel That Won't Stop Being Painful
Matthew Solan

17.00 - 17.15 The Stiff Hallux - Use of Hemiarthroplasty
Mark Glazebrook

17.15 - 17.30 Discussion

18.00-19.00 **Poster Viewing & Networking Reception with BOFAS Council Members** (Exhibition Hall)

Day 2 Thursday 6th November
Meeting Rooms - See below

08.30-12.30 **Workshops**

08.45-12.30 **AHP Meeting**
Main Meeting Room (Auditorium 2)

09.00-13.00 **GP Meeting**
Meeting Room 1 (Ground Floor)

09.00-10.30 **Difficult Cases**
Syndicate Room 4

12.30-13.00 **Exhibitors Meeting**
(Mass Media Space - Company Sponsors only)

13.00-14.00 **Lunch**

14.00-15.30 **Free Papers**

15.30-16.00 **Tea**

16.00-17.30 **Debate: Ankle fractures in UK Joint Session with OTS**
(Auditorium 2)

16.00 - 16.25 Where Are We Now?
Andy Molloy

16.15 - 16.30 Difficult Fracture Patterns
David Elliott

16.30 - 16.45 Difficult Bone
James Davis

16.45 - 17.00 Difficult Patients(diabetics)
Charles Saltzman

17.00 - 17.15 What Are We Going To Do About It?
Iain McFadyen

17.15 - 17.30 Discussion

17.30-18.00 **World Orthopaedic Concern**
(Auditorium 2)
WOC and the Ukraine
Magdi Greiss
Clubfoot in Malawi
Steve Mannion

18.00-18.20 **Speaker - James Ritchie**
(Auditorium 2)
From Trench to Breezy Brighton. Medicine at the Front and Rear in World War 1

19.30 **BOFAS Annual Dinner**
(Metropole Hotel Pre-Dinner Reception followed by Dinner)

Day 3 Friday 7th November
Main Meeting Room(Auditorium 2)

08.00-09.30 **Instructional 4: OutComm - The Steps So Far**

08.00 - 08.15 Dr Who? What is NJR Telling Us?
Andrew Goldberg

08.15 - 08.30 PHIN - What's Coming Around The Corner?
Matt James

08.30 - 08.45 Amplitude - Who We Are and What We Can Do

08.45 - 09.00 What Can We Learn from the Canadian Registry Experience?
Mark Glazebrook

09.00-10.30 **Free papers**

10.30-11.00 **Coffee** (Exhibition Hall)

11.00-12.30 **Current debates**

Haglund Deformity Osteotomy or Excision?
11.00 - 11.10 For Excision - Mark Glazebrook
11.10 - 11.20 For Osteotomy - Carlos Maynou
11.20 - 11.30 Discussion

Repair or Primary Fusion in The Management of Mid-foot Trauma?
11.30 - 11.40 For Repair - Murray Penner
11.40 - 11.50 For Fusion - Chris Blundell
11.50 - 12.00 Discussion

HAV MIS or Open?
12.00 - 12.10 For Open - Dishan Singh
12.10 - 12.20 For MIS - Peter Lam
12.20 - 12.30 Discussion

12.30-13.00 **Keynote speaker**
Charles Saltzman
Foot and Ankle - Into The Unknown? - Outcomes Networks and Computerised Adaptive Testing

13.00-13.10 **Best Paper/Best Poster Prizes**
Stephen Bendall & Bill Harries

Close of Scientific Meeting.

13.10-13.40 **Lunch**

13.40-15.30 **BOFAS AGM**
13.40 - 13.50 President Report
13.50 - 14.00 Ed Comm Report
14.00 - 14.10 Sci Comm Report
14.10 - 14.20 Coding Report
14.20 - 14.30 Webmaster Report
14.30 - 14.40 Treasurer Report
14.40 - 14.50 Accountant
14.50 - 15.00 Soap Box - time for floor to bring matter to attention AGM
15.10 - 15.20 New Members Vote/Council and President Elect Appointments
15.20 - 15.30 Presidential Handover to Anthony Sakellariou