



British Orthopaedic Foot & Ankle Society



# NOTTINGHAM 2019

ANNUAL SCIENTIFIC MEETING

13-15 NOVEMBER 2019 • EAST MIDLANDS CONFERENCE CENTRE

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# DEAR DELEGATE



It gives me very great pleasure to welcome you to Nottingham, a stone's throw from Leicester, where I work. We will, however, bring a little bit of Leicester up to you! As BOFAS grows, it becomes increasingly difficult to find venues that can accommodate us whilst also trying to keep the friendly and inclusive feel to the meeting that we all so enjoy and keeping the costs manageable. The East Midlands Conference Centre, though not as large as either Edinburgh or Sheffield, is large enough to accommodate all but it requires you to shuffle up, make friends with your neighbours, and fill all seats!

There is a large trade exhibition next to the auditorium and I encourage you to explore the stands as the support of the trade allows us to keep your costs down whilst providing, I hope, a meeting you all enjoy. Nottingham City Centre is close by and easily accessible.

The educational programme this year is a little different, with no overseas speakers and a focus on conditions which embrace other specialities, thus many of our speakers are from medical specialties as well as our own Society. I hope that the change of focus works, that you enjoy the programme and leave having learned from the speakers and indeed each other. I was very keen to make the care of diabetic foot disease a central focus of the meeting as the numbers make frightening reading and it is imperative that BOFAS, as a Society, takes this forward to tackle the problem with our medical colleagues.

I have kept the overall layout that has worked well over the last two years of moving the AGM to Thursday lunchtime as this is your Society and it is important that we hear your voice. I am very aware of how large BOFAS has grown over the (slightly frightening) 25 years since I first attended and we really do want to retain the inclusive nature of the Society, so please do come to the AGM – this is YOUR Society so we need to hear from you all. Please do introduce yourselves to us and each other over the next 3 days, renew acquaintances, make new friends and enjoy yourselves – the meeting up is almost as important as the scientific content and is vital in keeping the meeting as friendly as it currently is.

With this in mind, we have a Poster Viewing and drinks reception in the EMCC after close of play on Wednesday following which many of you will enjoy the pleasures of Nottingham either with friends or as the guest of many of the trade exhibitors.

On Thursday, our traditional 'Gala' dinner is, like the main meeting, a little 'different', but I hope enjoyable and entertaining and will be held in the Orchard Hotel itself.

BOFAS has 'gone green' this year, and, as you will have discovered by now, dispensed with programmes, bags

etc in an attempt to help reduce our environmental impact. I hope you approve and I hope that the App, which worked so well last year, and has been extended this year, provides you with all the information you require. There will be roving microphones around the auditorium for questions, but, like last year, you can also submit them via the App.

The Council and Committees of BOFAS continue to work hard throughout the year to fulfill the aims of the Society. The Committees will all report their work at the AGM but reports are also available on the App to keep you updated with everything that the Society is involved in, from the Educational courses we run, both in the UK and overseas, to the research work supported by the Scientific committee and the ongoing work of the Outcome committee on the Registry. I am extremely grateful to all of the committee members who have worked so hard for BOFAS and to Council who have supported me throughout this last year.

I would like to thank all those involved in the organisation of this meeting and am grateful to the venues, hotels, audio-visual team and caterers. My heartfelt thanks go to Jo Millard, who has done a sterling job of coordinating, organising and generally making this meeting what it is today - thank you Jo. Finally, to my colleagues in Leicester, thank you for your help and support throughout this year – it has been greatly appreciated.

I look forward to meeting, learning and socialising with as many of you as possible in the next 3 days. Please do say 'hello' but most of all, ENJOY!

With very best wishes

*Tricia Allen*



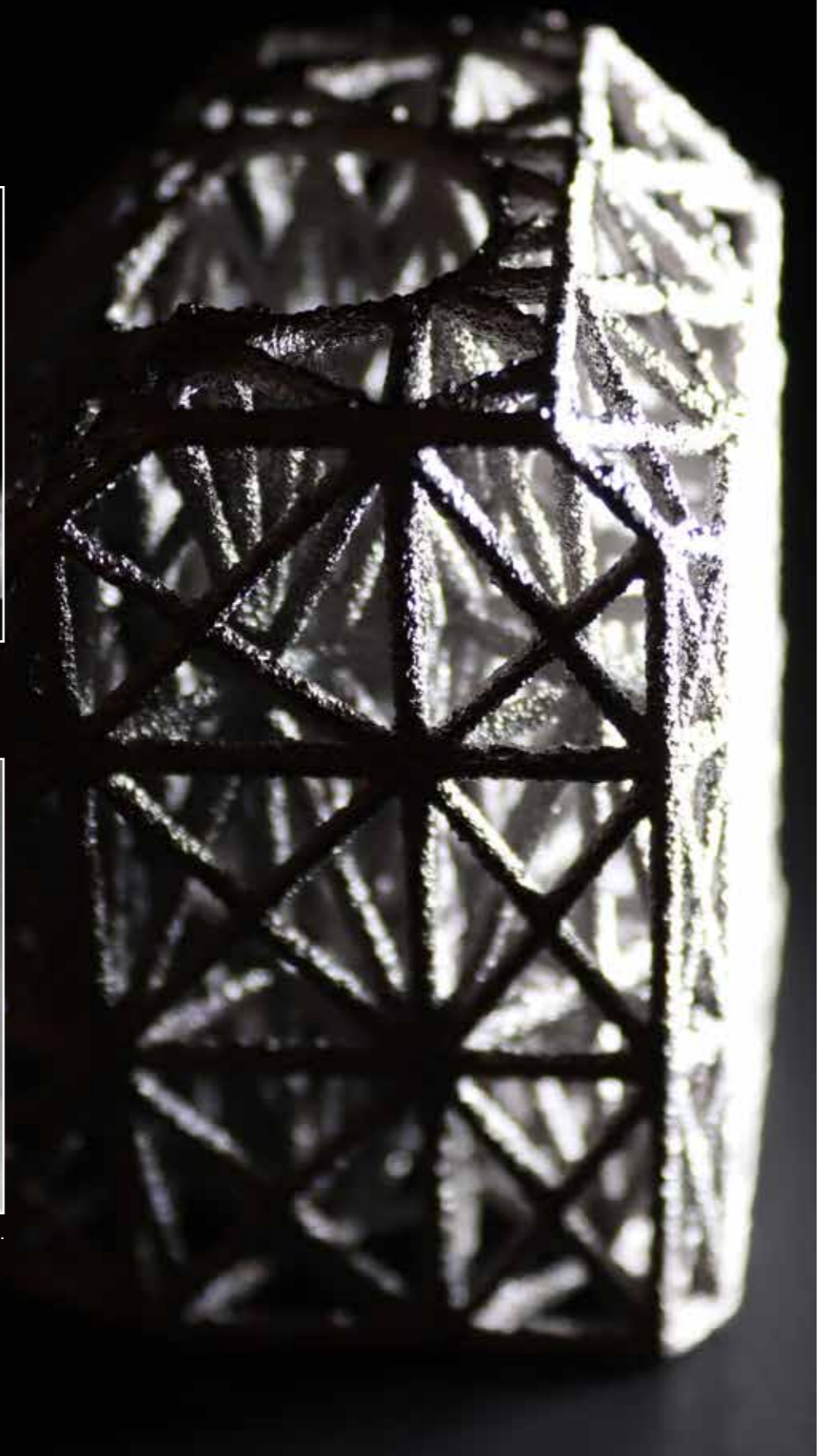
# Increase your options with Patient Specific Implants



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4WEB's Patient Specific Implants can be used in situations where other surgical options may be limited. Learn more about the options you have at the OrthoSolutions exhibition stand - P1.

# GENERAL INFORMATION

# CITY CENTRE MAP

## Registration & Exhibition Timings

Day	Registration Open	Lunch	Meeting Close	Additional Events
Wednesday 13th Nov	08:00	13:00 - 14:00	18:00	18:00 - 19:00 Poster Viewing Drinks reception
Thursday 14th Nov	08:00	12:00 - 12:45	18:00	19:15 - 23:00 Gala Dinner
Friday 9th Nov	08:00	11:10 - 11:40	13:30	

On registration you will receive a badge, a lanyard and a pen.  
There will be no paper programme or bags at this year's conference.  
A PDF Version of the programme can be found on the BOFAS website Annual Meeting page or on this APP.

## Gala Dinner Tables

A drinks reception with canapés will be held from 19.15hrs in the restaurant of the DeVere Orchard Hotel. The gala dinner will be held on the ground floor of the DeVere Orchard Hotel.

Dinner tables are free seating.

If you are a vegetarian or have a food allergy, there will be a place card for you to collect before you enter for dinner.

Please note that if you are staying in the hotel but not attending the Gala dinner, the restaurant will be closed during the evening and the bar will be closed until 10.30pm, when it will re-open to hotel residents.

## Cloakroom

The cloakroom in the conference centre will be open between 08.00hrs – 18.00hrs daily and is located on the ground floor.

## CPD Points

Wednesday 6 points, Thursday 6 points, Friday 4 points.

A certificate of attendance is issued by email following the Annual Meeting on completion of the Feedback Survey, which can be found on the conference App.

The survey will close 1 month following the meeting. No certificates will be available after this time.

## Badge Types

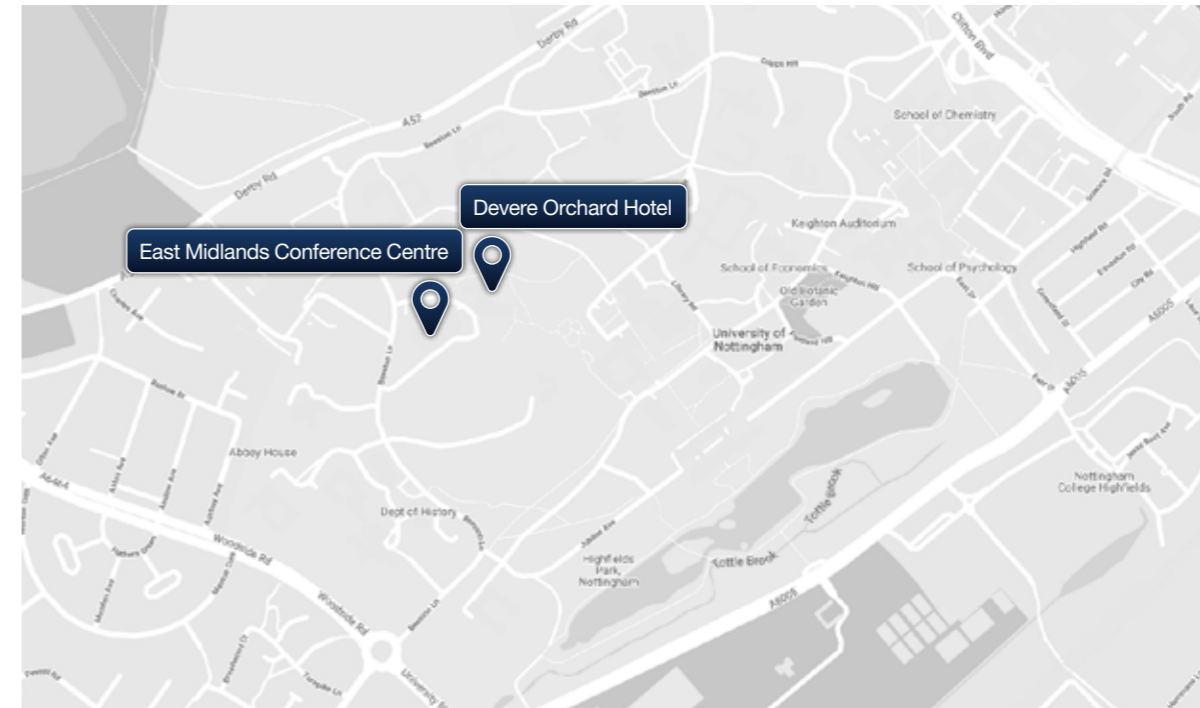
Faculty	Red	Allied Health Professional	Light Blue
BOFAS Full Member	Dark Blue	Trainees & Non members	Light Blue
BOFAS Retired Member	Dark Blue	Exhibitors	Green

## Refreshments

Tea and coffee will be served daily in the exhibition areas shown as red blocks on the Exhibition Plan during the morning and afternoon break.

Lunch will be served on Wednesday and Thursday in the exhibition areas shown as red blocks on the Exhibition Plan.

Brunch will be served on Friday during the midmorning break due to programme timings.



## Train

Visit [https://www.nationalrail.co.uk/stations\\_destinations/174381.aspx](https://www.nationalrail.co.uk/stations_destinations/174381.aspx) for further information and routes.

## Local Taxis

DG Cars are recommended – visit <https://dgcars.co.uk> for more details. Other taxi firms are available.

## Parking

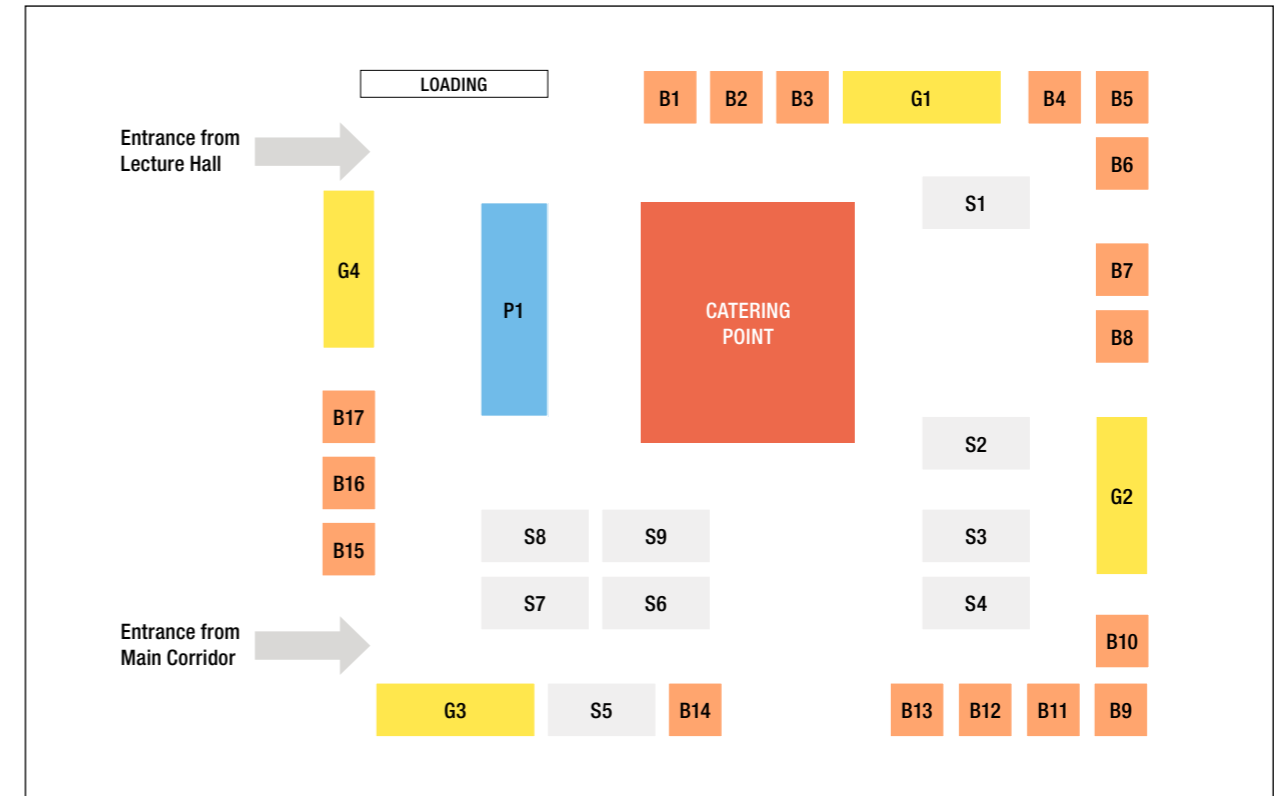
There is free parking on site at the East Midlands Conference Centre.

# POSTER LOCATIONS

Poster presentations can be found in the Exhibition Hall.

- P1. Comparative study assessing sporting ability after arthrodesis and cartiva hemiarthroplasty for treatment of hallux rigidus.
- P2. Severe insertional Achilles tendinopathy: Our experience with two different surgical techniques.
- P3. Surgical reconstruction in patients with a delayed presentation of TURF toe injury: early functional outcomes.
- P4. Does the presence of pes planus deformity increase recurrence of hallux valgus deformity following surgery?
- P5. The posterior malleolus approaches clock: a method of guiding incision choice for fragment specific fixation.
- P6. The spring ligament meniscus: an anatomical study.
- P7. High BMI increases rates of non-union in hind and mid-foot arthrodesis.
- P8. Surgery for non-union after 5th metatarsal fractures - the good guy becomes the bad guy!
- P9. Nottingham experience with the fixed bearing Infinity Total Ankle Replacement.
- P10. Long-term outcome of ankle replacements in patients with inflammatory joint disease and osteoarthritis: Is there a difference?
- P11. Outcomes of spiral osteotomy of the tibia to correct coronal plane deformities in patients with concomitant end-stage osteoarthritis of the ankle.
- P12. The evaluation of outcomes for neglected or relapsed club-foot managed with circular frame in a low-income country.
- P13. The ability to wear high heeled footwear after first metatarsophalangeal joint fusion.
- P14. Early outcomes of pes planus reconstruction using either hamstring allograft or synthetic ligament.
- P15. Subtalar arthroereisis as an adjunct for treatment of the flexible adult acquired flatfoot deformity. – a 9 years experience
- P16. Early experience of autologous graft, hydroxyapatite & calcium sulphate antibiotic paste in revision hind-foot & ankle arthrodesis.
- P17. Minimum two year outcomes of a fixed bearing total ankle replacement in the United Kingdom.
- P18. Management of osteomyelitis of the diabetic foot using highly purified calcium sulphate impregnated with antibiotics: a 2 year follow up.
- P19. Comparison of topical skin adhesive and simple interrupted nylon sutures for wound closure in forefoot surgery: a prospective randomised trial.
- P20. Comparative analysis of dorsal nerve relocation versus dorsal neurectomy in the surgical management of Morton's neuroma.
- P21. High Incidence of spring ligament failure in ankle fractures with complete deltoid ruptures: a previously missed entity leading rapid destabilisation of the first ray and symptomatic adult flat foot.
- P22. Role of subtalar arthroereisis as adjunct procedure in treating stage IIb adult-acquired flatfoot deformity.
- P23. Charcot foot reconstruction - how does hardware failure and non-union affect the clinical outcomes?
- P24. The anatomy and insertion of the anterior inferior tibiofibular ligament and the wagstaffe fracture.
- P25. Revision of failed primary total ankle replacements to the Inbone 2 Total Ankle Replacement system: the Nottingham Experience.

# EXHIBITION PLAN



Company	Stand No.	Company	Stand No.	Company	Stand No.
Orthosolutions	P1	DePuy Synthes	S7	Paragon28	B8
Exactech	G1	Bioventus	S8	Actisound	B9
Stryker	G2	Standing CT Company	S9	BOA	B10
Arthrex	G3	Int2Med	B1	Integra	B11
Wright	G4	Vertec	B2	OPED	B12
Medartis	S1	Biocomposites	B3	Lavender Medical	B13
Zimmer Biomet	S2	Joint Operations	B4	Acumed	B14
Bonesupport	S3 + S4	Neoligaments	B5	Athrodax Healthcare	B15
Regen Lab	S5	Orthofix	B6	Xograph	B16
Marquardt UK	S6	MPI Group	B7	DJO UK Ltd	B17

# GOLD SPONSOR WORKSHOPS

THURSDAY 14<sup>TH</sup> NOV

## ARTHREX

Syndesmosis Reconstruction with Syndesmosis TightRope® XP and InternalBrace™.

**LOCATION:** Conference Suite 2a/b

**Summary:** Try out the latest developments in the treatment of the unstable syndesmosis using the new Syndesmosis TightRope XP device with a hands on sawbone workshop. You'll also have the opportunity to further enhance stability of the rotational forces by augmenting your AITFL repair with InternalBrace.

## EXACTECH

Times: 08:30 | 09:45 | 11:00

**LOCATION:** Conference Suite 1b/c

### Vantage Ankle Replacement:

Design Rationale 20 minutes

### Review of the Surgical Technique :

Re-Live Surgery 20 minutes

Hands-on Workshop 20 minutes

### Faculty

James DeOrio, MD, is a foot and ankle specialist, and professor of orthopedic surgery at Duke University. Dr. DeOrio completed his fellowship at the AO Foundation in Switzerland, and is world-renowned foot and ankle surgeon, passionate about research and development in Total Ankle.

Join during the timeslot that best fits your schedule.

## ORTHOSOLUTIONS

Ankle fractures; evidence based treatment - the first fracture specific plating system

### PRESENTERS:

Andy Molloy & Lyndon Mason (University Hospital Aintree)

### SESSION TIMES:

**Session 1:** 9:15AM TO 10:00AM  
(10:00AM – 11:00AM COFFEE IN EXHIBITION AREA)

**Session 2:** 11:00AM TO 11:45AM

### LOCATION:

Gallery 2/3 (upstairs in the Atrium of the De Vere Orchard Conference Centre)

## WRIGHT MEDICAL

**LOCATION:** Conference Suite 2c

### Practical One:

#### CARTIVA® – Hallux Rigidus Continuum of Care

Speakers: Mr. Chris Blundell & Mr. Mark Davies (Sheffield)

Workshop Time: 09:00 – 10:15

Mr. Davies and Mr. Blundell will discuss the pathology and treatment of Hallux Rigidus using the Cartiva® Synthetic Cartilage Implant. Presentation of the MOTION study data and discussion on tips, tricks and latest updates will be followed by: Wet Lab workshop and Round Table discussion on patient selection and decision making.

**COFFEE AVAILABLE OUTSIDE OR AT BACK OF ROOM PLEASE FOR 30 DELEGATES**

### Practical Two:

#### SALVATION - Save a Life, Save a Limb: Charcot Foot Decision Making.

Speaker: Dr. Hodges Davis, US (OrthoCarolina)

Workshop Time: 10:30 – 12:00

International guest speaker Dr. Davis shares his expertise on the decision making process of diabetic foot treatment. The discussion will explore patient selection and treatment methods when presented with the mid-foot Charcot condition.

# FACULTY BIOGRAPHIES



## Patricia Allen

Patricia Allen graduated from the University of Birmingham in 1988 and undertook her medical training in Birmingham and Bristol with a Fellowship in Foot and Ankle Surgery and Paediatric Orthopaedics in Dublin. She was appointed Consultant Orthopaedic Surgeon at the Bristol Royal Infirmary/Bristol Children's Hospital in 2000 before moving to Leicester in 2003 to set up the Foot and Ankle Service there. She oversees the Foot and Ankle Senior Fellow post there and runs the Orthopaedic post-graduate teaching programme. She served on the Scientific Committee of BOFAS for 6 years before becoming Honorary Secretary from 2013-2017.



## Charlotte Angel

Hailing from St Georges, London & The South West Peninsula Deanery, I am currently the Foot & Ankle Fellow in Exeter, having also undertaken the Bristol Lower Limb Recon Fellowship. I am heading to a substantive Consultant post in Truro in January.



## Dr Jo Appleby

Dr Jo Appleby is Associate Professor of Archaeology at the University of Leicester. She is an osteoarchaeologist with particular interests in understanding human ageing from the skeleton, the British and European Bronze Age and using human skeletal remains to understand past mortuary practices, particularly in relation to cremation. She was the osteoarchaeological lead in the analysis of the skeleton of King Richard III.



## Robert Ashford

Professor Robert Ashford is a Consultant Orthopaedic & Musculoskeletal Tumour Surgeon at the University Hospitals of Leicester and an Honorary Sarcoma Surgeon at Nottingham University Hospitals. He qualified at the London Hospital Medical College, undertook his higher orthopaedic training in Yorkshire and fellowships in Sydney and Stanmore. He is the lead clinician of the East Midlands Sarcoma Service and was appointed Honorary Professor at the Leicester Cancer Research Centre earlier this year.

His clinical practice is musculoskeletal tumours and lower limb arthroplasty and clinical research interests are palliative orthopaedic surgery, skeletal metastases and functional outcomes of sarcoma surgery. He was chosen by the BOA as an ABC Travelling Fellow in 2014 and is the President of the British Orthopaedic Oncology Society.

## Professor Roger Atkins

Professor Roger Atkins is a consultant Orthopaedic surgeon with more than 30 years' experience. He qualified from Oxford University and Guy's Hospital medical School and trained in London, Sheffield in Oxford before taking up a consultant post in Bristol.

His specialist clinical interests include foot and ankle surgery, fracture surgery and Ilizarov frame surgery. His major research interest is in the causation, prevention and treatment of disability following injury. He has lectured on the subject at an international level, published over 100 papers and been awarded a personal chair at the University of Bristol.

He has had a clinical and research interest in complex regional pain syndrome for nearly 40 years and wrote his doctoral thesis at the University of Oxford on this subject. He has lectured, researched and published widely in this area.



## Maneesh Bhatia

Mr Maneesh Bhatia is Consultant Orthopaedic, Foot & Ankle Surgeon at University Hospitals of Leicester. He has done his Orthopaedics training in South East Thames & Fellowship in Foot & Ankle Surgery at Cambridge. He was awarded the European Travelling Foot & Ankle Fellowship to USA in 2009. He is an examiner for the Royal College of Surgeons. He is the editor of recently published book - An Orthopaedics guide for today's GP. He has co-authored the chapter on Forefoot disorders in Oxford Textbook of Trauma & Orthopaedics. He has worked as chief or principal investigator for randomised controlled trials. His research interests include Achilles tendon problems, Morton's neuroma, ankle arthritis and first ray surgery.



## Rick Brown

Rick Brown graduated from the University of Cambridge and King's College Hospital, London, before completing orthopaedic training on the Middlesex & Stanmore Rotation, London and then Fellowships in Sydney and at Harvard, USA. After appointment as a Consultant Orthopaedic Surgeon in 2004, he established the new Foot and Ankle Service in Cheltenham and ran a Regional Paediatric Foot Clinic at Bristol Children's Hospital. His interest in Education led to serving two terms on the BOFAS Education committee, where he is now the Chairman. He is a Lead Examiner for the FRCS (Tr & Ortho). In 2016 he was appointed as a Consultant in the Foot & Ankle Team at The Nuffield Orthopaedic Centre, Oxford, where his practice covers all areas of Foot & Ankle surgery including sports injuries, neurological conditions, complex forefoot pathology, arthritis and young adult problems.



## Kevin Bruce

Kevin Bruce MSc. First Podiatry Ltd. North West London and Cambridge

Kevin qualified as a Podiatrist in 2006 and has always been involved in a musculoskeletal caseload.

After completing his MSc in 2009 in Clinical Podiatric Biomechanics he progressed through roles in the NHS as musculoskeletal lead clinician whilst gradually developing a greater caseload working in the private sector. As that continued to grow opting to leave the NHS completely.

With a history playing professional football at West Bromwich Albion, the experiences gained whilst playing football led him toward Podiatry.

Despite football being the initial inspiration it is not only football and sports related pathology that his interest lies but also those in the general population whether sporting or otherwise. He enjoys the variation of a caseload including elite athletes, recreational athletes, dog walkers, Hypermobility Spectrum Disorders, EDS to name a few.





### Anna Chapman

Anna Chapman is a Consultant Trauma and Orthopaedic Surgeon at University Hospitals, Coventry and Warwickshire with a specialist interest in Foot and Ankle surgery. She qualified from Guy's, King's and St. Thomas's Hospitals School of Medicine in London, and completed her orthopaedic training on the Warwick rotation. She undertook Fellowship training in Bournemouth and Bristol, and was appointed as a Consultant in 2012.

She completed a Masters Degree in Medical Education at the University of Warwick in 2010 and continues to pursue her interest in all things educational. Anna is currently the Deputy Training Programme Director for the Warwick Orthopaedic Specialist Training Programme.

1993-pres.: Co-founder/Coordinator of the Biennial COFAS Symposia  
2002-04: Co-Founder/Past President, COFAS



### Robert Clayton

Robert Clayton moved to Edinburgh in 1994 and graduated in 2000. He undertook Basic and Higher Surgical training in the South East Scotland region. He undertook fellowship training in Foot & Ankle surgery in Glasgow in 2009 before taking up post as a Consultant Orthopaedic Foot & Ankle Surgeon in Fife in 2010. He has a highly specialised elective and trauma foot and ankle practice. He has an active role in undergraduate and postgraduate medical education and orthopaedic research and has served on faculty at numerous courses and conferences across the United Kingdom. As Media and Communications Director, he is on the council for BOFAS.



### Tim Clough

Tim Clough graduated from St Andrews, Scotland and Manchester in 1992, gained specialist training in Manchester before completing his Fellowship training in Canada. He was appointed Consultant F+A surgeon at Wrightington Hospital in 2003. He is an Honorary Senior Lecturer at the University of Salford and is committed to both research and medical education, sitting on the R+D Committee of his NHS Trust, is regular Faculty member to Courses and Conferences, runs a F+A Cadaver workshop, lectures on the Biomechanics programme at the University of Dundee, is a member of the International Advisory Board for 'The Foot' and is a reviewer for the journal.



### Dr Helen Cohen

Dr. Helen Cohen MB;BCh, PhD, MRCP.

Dr Cohen is a Consultant in Rheumatology and Chronic Pain at the Royal National Orthopaedic Hospital, Stanmore. She has a specialist interest in the management and treatment of chronic pain, and specifically in Ehlers Danlos Syndrome (EDS) / hypermobility and Complex Regional Pain Syndrome.

Her clinical interests include general rheumatology, EDS / hypermobility, fibromyalgia and CRPS among other chronic, difficult-to-explain pain syndromes. She leads the Hypermobility and CRPS Rehabilitation Programmes at Stanmore and works closely with her orthopaedic colleagues. She is a member of the International Consortium on Ehlers-Danlos Syndromes and Related Disorders which has collaborated to produce the updated 2017 Diagnostic Criteria for EDS. She is a member of the Royal Society of Medicine Rheumatology council and president elect of this section.

### Paul Cooke

Paul Cooke retired from NHS practice 2 years ago, after over 30 years as a consultant at the Nuffield Orthopaedic centre.

He is past secretary, past president and an ex trustee of BOFAS and was a founding committee member of EFAS. He developed and introduced many new surgical techniques, and continues to consult on development of implants and techniques.

His retirement practice is now outpatient based, seeing difficult second opinions, and complex medicolegal cases.

He still teaches regularly, and has been a faculty member on the BOFAS principles courses in Oxford, Zambia and Ethiopia since retiring.

He also has a life outside orthopaedics! He sits on the AOFAS editorial board for Foot and Ankle Orthopaedics (FAO) as well as AOFAS OFAR Managerial Board.



### Justin Coulter

Mr Justin Coulter Bsc(Hons), PGDip (Bio), MChS, Musculoskeletal Podiatrist at The London Orthopaedic Clinic and director of First Podiatry in North London.

Mr Coulter completed his undergraduate training at Wits in South Africa in 1995 and soon after moved to London.

He worked in the NHS for 2 years while also building a private practice and entered full time private practice in 1997. His interests lie in sports medicine, conservative management of foot and ankle disorders and the effects of hypermobility on foot function.

Mr Coulter has worked and continues to work with a multitude of sporting bodies including British Athletics, English Institute of Sport (EIS), England cricket, Saracens and Wasps Rugby Clubs as well as Premiership football. He also provides musculoskeletal podiatry services to The Royal Ballet and the English National Ballet.



### Nick Cullen

Nick Cullen was appointed as a Consultant in the Foot & Ankle Unit of the Royal National Orthopaedic Hospital Trust, Stanmore in August 2005. The Foot & Ankle Unit at the RNOH is a tertiary referral centre, treating many of the complex foot & ankle cases that are referred from hospitals throughout the South of England. Dealing solely with problems of the foot & ankle, Mr Cullen's interests include sports injuries, bunion, toe deformity, arthroscopy, arthritis and tendon disorders.



### Howard Davies

Howard Davies graduated from Manchester University and completed his Orthopaedic training in Leeds and the East of England. He undertook a Foot & Ankle Fellowship in Sheffield and joined the Sheffield Foot and Ankle Unit as a Consultant and honorary clinical lecturer in 2013.

He is a regional clinical co-ordinator for the National joint registry and regularly teaches on regional and national courses.







### Mark Davies

Mark Davies was appointed as a Consultant Orthopaedic Surgeon in 2006 with a special interest in treating elective and traumatic conditions of the adult foot and ankle at the Northern General Hospital, Sheffield. He qualified from the University of Southampton in 1993 and undertook basic training in London, Oxford and Swindon prior to commencing Orthopaedic training in Sheffield. He is both Fellowship trained in Limb Reconstruction techniques (Sheffield) and in Adult Foot & Ankle surgery, having spent 2005 working with the renowned Dr Terry Saxby at the Brisbane Foot & Ankle Centre. He currently directs the research being produced from the Sheffield Foot & Ankle Unit into all manner of foot and ankle pathologies. He has published extensively on all aspects of foot and ankle surgery.



### James Davis

James Davis was appointed as a consultant with a special interest in conditions of the adult foot and ankle at Torbay hospital in 2001. He underwent post graduate training on the South West Thames rotation and a fellowship at the Johns Hopkins University Hospital in Baltimore USA. He specialises in all adult foot and ankle disorders including joint replacements. James has been secretary and chairman of the Education Committee of BOFAS and is now President Elect. He has finished 10 years as FRCS (Tr+Orth) examiner during which time he was also Training Programme Director for the Peninsula Orthopaedic Training Rotation.



### Raman Dega

JRaman Dega is a Consultant Orthopaedic Surgeon at Wexham Park and Heatherwood Hospitals NHS Trust (now part of Frimley Health NHS Foundation Trust). He trained on the Royal London Hospital Orthopaedic rotation which included working at the Royal National Orthopaedic Hospital Stanmore. During his training he worked for two past presidents of the British Orthopaedic Foot and Ankle society. This influenced Mr Dega to specialize in foot and ankle surgery when he was appointed as consultant in 1998. He is a reviewer for the Foot Journal and for the Journal of Bone and Joint. He is a Trainer for Orthopaedics and was a member of the Regional Oxford Orthopaedic Training Committee for ten years.



### Dhar Sunil

Having obtained my undergraduate qualifications in India, I subsequently trained in the UK, being on the Liverpool Orthopaedic Training Program where I developed my interest in Foot & Ankle Surgery. This was followed by a Limb Reconstruction Fellowship in Sheffield and travelling Fellowships in the USA and Russia. I was appointed Consultant Orthopaedic Surgeon in 1995 and have been at Nottingham University Hospitals since 1997.

I have served as the President of two national societies, the British Orthopaedic Foot & Ankle Society (BOFAS) in 2010 and the British Limb Reconstruction Society (BLRS) from 2010-2012.

My research interests include ankle arthroplasty and deformity correction of the foot and ankle.

I am closely associated with national bodies (NICE, BOA) in implementing evidence based treatments that are cost effective. I am widely published and regularly invited to speak at national and international meetings.

### Professor Michael Edmonds

Professor Michael Edmonds is Consultant Physician at King's College Hospital ,London with special interest in the care of the diabetic foot.

He developed a new model of diabetic foot care, the multidisciplinary Diabetic Foot Clinic, in 1981, to provide early, aggressive treatment of the various factors that contribute to the rapid progression of diabetic foot problems.

The clinic at King's College Hospital, one of the first in the world, brought about a 50% reduction in major amputations in people with diabetes. His work underpinned the St Vincent declaration which, in 1989, set a target, in Europe, of reducing major amputations by 50% in people with diabetes.

He was Chairman of The Diabetic Foot and Amputation Subgroup of the British Diabetes Association's St Vincent Joint Task Force for Diabetes from 1996-2000. He was also Chairman of the Diabetic Foot Study Group (DFSG) of the European Association of the Study of Diabetes from 2001-2005.

His work has had three main aims: firstly, to develop the best possible care for people with diabetic foot problems, secondly to research into the causes of and devise new treatments for the diabetic foot and thirdly, to teach health care professionals about best care of the diabetic foot.

In 2007, he was conferred the title of Professor of Diabetic Foot Medicine in recognition of his research and innovations of care.

He has co-authored the book Managing the Diabetic Foot (Blackwell Science) and A Practical Manual of Diabetic Foot Care (Blackwell Science), which was voted BMA Book of the Year in 2004.

He won the Karel Bakker award at the 6th International Symposium on the Diabetic Foot in 2011, and Edward James Olmos Award for Amputation Prevention in 2014.

He gave the Arnold Bloom Lecture to Diabetes UK in 2014 entitled "The benefits of working together in diabetic foot care for the vulnerable patient"



### Jeremy Field

Jeremy Field is a Consultant Orthopaedic and Hand Surgeon who qualified in London and took an SHO post there and then moved to Southampton to become a general surgical registrar. He then did Plastic Surgery in Cambridge for six months where he developed an interest in Hand Surgery before obtaining an Orthopaedic Registrar job in Bristol. In order to further his career he wrote a thesis in algodystrophy (RSD or complex regional pain syndrome type 1).

He then moved to Sydney in Australia to do a hand fellowship for a year. He worked at Sydney Hospital and St Lukes Hospital where he was allowed to perform all aspects of hand surgery particularly scaphoid fractures. He gained huge experience working for Professor Bruce Connolly and Tim Herbert and this confirmed the career path he wanted to follow in hand surgery.

He then returned to Bristol and then completed his registrar training in Bristol writing various papers on Colles fractures, Darrick's procedure and algodystrophy.

With such a strong academic background he still has a keen research interest. He submits a paper in a peer-reviewed journal approximately once a year. 90% of his surgery is hand surgery and the remainder is general orthopaedics. His particular interests are Dupuytren's disease and arthritis and consequently joint replacement in the hand.

He was appointed as an orthopaedic college examiner in 2004.

He currently holds an NHS post at Cheltenham General Hospital where he has been since 1996.





## Andrew Furlong

Andrew graduated from the University of Birmingham Medical School in 1989 and joined the Trust in September 2000 as a Consultant Trauma & Children's Orthopaedic Surgeon.

Andrew has worked in clinical leadership roles for over 10 years including as Head of Service for Trauma, Deputy Training Programme Director, Clinical Director for Musculoskeletal Services, Divisional Director for Planned Care Services and Deputy Medical Director.

Andrew is married with two children and lives in the Charnwood villages. He plays occasional golf and enjoys road cycling.



## Edward Gee

Mr Edward Gee is a Foot and Ankle consultant at the major trauma centre for the Manchester region (Salford Royal Hospital). He completed a post-CCT fellowship with Tim Schneider and David Shepherd of the Melbourne Orthopaedic Group, Australia, after being fortunate enough to receive the esteemed Gold Award from BOFAS. Mr Gee has specialist interests in tendon and ligament reconstructions around the foot and ankle and he works as the training lead, audit lead and orthopaedic diabetic foot lead within his trust.



## Andrew Goldberg

Mr Andrew Goldberg qualified at St Mary's Hospital Medical School (Imperial College) in 1994. His specialist training was on the North East Thames rotation in trauma and orthopaedics with a specialist fellowship in complex foot and ankle disorders at the Oxford Nuffield Orthopaedic Hospital with Mr Paul Cooke. Prior to this, he also spent a year on a travelling fellowship to 15 centres of excellence across the US and Europe.

Mr Goldberg became an orthopaedic consultant in 2009 and spent a year in Northampton before moving to the Royal National Orthopaedic Hospital NHS Trust in April 2010 in a joint appointment with UCL as a Clinical Senior Lecturer. In August 2018 he moved into full time private practice but continues to run his research programme at UCL and RNOH. He sits on the Editorial Committee and Medical Advisory Committee for the National Joint Registry. He runs a pioneering research program exploring regenerative treatments including cartilage repair, stem cells in Achilles tendinopathy (ASCAT) and a national NIHR HTA trial comparing ankle replacement against ankle fusion (TARVA). In the 2011 Queen's New Year Honours List, he was awarded an OBE for services to medicine. He sits on the OFAR Board for AOFAS and the Outcomes Committee for BOFAS and is on the Editorial Committee for Foot & Ankle Orthopaedics and is a reviewer for Foot & Ankle International and the Bone & Joint Journal.



## John Grice

John Grice works at Great Western Hospital, Swindon. Fellowships were Bournemouth and London with Mr Calder, Mr Williams and Mr Taylor. He also completed short fellowships in Malawi (BOFAS) and Amsterdam with Prof. Van Dijk. Mr Grice is currently the pitch side doctor for Swindon Town FC, GB senior Hockey team and the ABA. He has been invited to lecture on a number of international instructional courses and leads audits and research in foot and ankle treatments and sport medicine.

## Xavier Griffin

Xavier Griffin PhD, FRCS (Tr&Orth) Associate Professor of Trauma Surgery at the University of Oxford and Honorary Consultant Trauma Surgeon at the John Radcliffe Hospital, Oxford.

Xavier is Chief Investigator for NIHR randomised clinical trials and commercially funded grants. His research interest is in clinical and cost effectiveness of musculoskeletal trauma interventions.

Xavier has several Research Committee appointments including, but not limited to; Cochrane, Arthritis UK and British Orthopaedic Association.

Xavier serves in the Reserve Forces and believes that his military training has provided him with transferable skills enabling him to enhance his medical and research career.



## Paul Halliwell

Paul is a foot and ankle orthopaedic surgeon based in Guildford, Surrey. His particular clinical interests include ankle joint replacement and reconstructive work in both the adult and immature foot. He trains fellow surgeons on the indications and operative techniques for the Scandinavian Total Ankle Replacement. As a member of the Education Committee, he co-developed the BOFAS Principles Course and is now chairman of the BOFAS Outcomes Committee, responsible for developing and promoting the BOFAS Registry.



## Kartik Hariharan

Kartik Hariharan has been the Clinical Lead for a large Foot And Ankle Centre of Excellence working for the Aneurin Bevan University Health Board in Newport South Wales United Kingdom.

He is well known in the world of foot and ankle surgery. He was the President of the British Orthopaedic Foot and Ankle Society in 2011-2012 after serving as Chairman of Education for the society. He is the Trustee of that organisation now.

He has pioneered many procedures in the field of foot and ankle surgery and has a large portfolio of published research.

His specialist field of expertise is in deformity correction in the foot and ankle, minimally invasive surgery, complex reconstruction In The diabetic Charcot foot , rheumatoid arthritis and complex foot and ankle trauma. He also has vast experience of the treatment of sports related and dancers conditions in the foot and ankle.

He is the Chairman of the Clinical Commissioning group for foot and ankle surgery for the Royal College of Surgeons and the Dept of Health.

He has been a specialist Advisor for the National Institute of Clinical Excellence.

He is well known for his lectures both nationally and internationally and featured in a BBC production 'Dissected: The Incredible Human Foot'.

In 2015 he was awarded the prestigious Naughton Dunn Lecture by the British Orthopaedic Association.

He is also the proud recipient of the Ram Janam Sulakshana Pandey Oration In 2016.

He was awarded the prestigious Sir Rowland Hughes Memorial Oration by the Welsh Orthopaedic Society in 2017.

He has recently been made an Honorary Fellow of the Indian Orthopaedic Association for his contribution to Indian Orthopaedic Education.

He is the Clinical Lead for Patient Reported Outcomes for the Aneurin Bevan University Health Board South Wales.

He was the Foot and Ankle Surgeon for the Newport Gwent Dragons, Newport County Football Club and the Newport Cricket club.





### Simon Hodkinson

I have been a Consultant Orthopaedic Surgeon for the last 24 years, initially in the Royal Navy and for the last 20 years in Portsmouth

I trained, as one did in those days, as a general Orthopaedic surgeon but soon saw the light and specialised in foot and ankle surgery.

Early on in my career I developed an interest in education with the then fledgling ATLS instructors course and have continued in such a vein throughout my career.

Once I transferred to the NHS I became the RCS Surgical Tutor in Portsmouth and then in 1999 the Training Programme Director for Wessex. A thoroughly rewarding post I held for 8 years.

During my time as TPD I sat on the SAC for the 5 year term and then Chaired the TPD forum, remitting this year.

For the last three years I have served as a Trustee of the BOA and in January take up the post of Honorary Secretary of the BOA and Chair of the Education Board.



### Darren James

Darren is a Senior Lecturer in Biomechanics at London South Bank University, Fellow of the Higher Education Authority, consultant to Lanserhof London, and member of the Physiological Society and European College of Sports Science.

He received his PhD in 2012 for his work using neuromuscular electrical stimulation on the intrinsic foot musculature. He has been the recipient of two BOFAS grants, which have helped demonstrate the potential of NMES for strengthening the abductor hallucis muscle; and secondly, enabled the design of a prototype medical device. His current work is focussed on translating all of this to Hallux Valgus deformity.

Darren's other main research interest is understanding the functional relationship between the toe flexors and ankle plantarflexors.



### Rajesh Jogia

Rajesh qualified from The London Foot Hospital in 1986 and started working for Leicestershire Health Authority. He completed his teacher training in 1988 and was visiting lecturer at Birmingham School of Podiatric Medicine for 2 years. He became head of biomechanics and diabetes for the podiatry department in 1988. Rajesh gained his fellowship in podiatric surgery in 1995 and was appointed as Leicestershire's first consultant in podiatric surgery in 1998. He is currently Head of Service for podiatric surgery. He continues to have a special interest in the management of the diabetic foot and works as part of a multidisciplinary team at University Hospitals of Leicester.



### Venu Kavarthapu

Prof. Venu Kavarthapu completed his Orthopaedic training in London and USA before joining as a Consultant Orthopaedic Surgeon at King's College Hospital. He is the Orthopaedic lead at King's diabetic foot multi-disciplinary unit and has established the functional limb salvage Charcot foot reconstruction service which is recognised nationally. He is passionate about training and education and has held a number of posts, including the current Regional Orthopaedic Training Programme Director. He established the 'Multidisciplinary and Surgical Reconstruction of Charcot Foot' symposium and 'King's Charcot Foot Reconstruction Cadaver Workshop' course in London. He lectures nationally and internationally and is a dynamic member of several specialist societies including A-DFS. He is actively involved in research and published several scientific articles in Trauma and Orthopaedics. His other responsibilities include Honorary Senior Lecturer at King's College London, Chairman of British Indian Clinical and Academic Partnership and Associate Professor University of Southern Denmark.

### Nikki Kelsall

Nikki Kelsall graduated from Bristol and trained in Wessex. She was appointed as a Trauma Surgeon with a special interest in Diabetic Foot disease in Poole in 2015 and added elective foot & ankle surgery in Bournemouth to her job plan in 2016. Nikki regularly teaches at regional teaching days and arranges the departmental teaching. She is co-director of the Wessex MRCS preparation course and faculty for ATLS. She was formally the Lead for the Wessex Medical Education Fellows and faculty for Tomorrow's Teachers.



### Togay Koç

Togay Koç has recently been appointed as a Consultant Trauma and Orthopaedic Surgeon with a specialist interest in Foot & Ankle Surgery at Queen Alexandra Hospital, Portsmouth. He qualified from Guy's King's and St Thomas' Schools of Medicine in London before completing his orthopaedic training in the Wessex Deanery. He has been on Fellowships to Southampton, Oxford, Guildford and Frimley as well as a visiting Fellowship to Harborview Hospital, Seattle, USA.



### Dr Nikhi Kotnis

Dr Kotnis has worked as a Consultant Musculoskeletal Radiologist in Sheffield for 9 years. He did his Radiology training in Nottingham and then undertook a one year fellowship in MSK imaging at McMaster University in Hamilton, Canada. His main areas of interest are Sports, Sarcoma and Trauma Imaging. He has both published and presented in these fields. He works closely with the Foot & Ankle Orthopaedic team in Sheffield and has developed an interest in this area due to close collaboration with his Orthopaedic colleagues'



### Constantinos Loizou

Constantinos Loizou is currently a consultant orthopaedic surgeon at the Nuffield orthopaedic centre at Oxford with a specialist interest in elective conditions of the adult foot and ankle as well as the diabetic foot and bone infection. He also has an interest in foot & ankle ultrasound and he is CASE accredited. He qualified from the University of Cambridge and undertook his specialist training at the East of England. He is fellowship trained in adult foot & ankle surgery, having spent a year at Oxford (Nuffield Orthopaedic Centre) and six months in Australia (Melbourne Orthopaedic Group). In 2015 he won the Chang Chen Prize for best podium presentation at the BOFAS annual scientific meeting. He has a basic science background having studied molecular & cell biology at the University of Bath and gained a PhD in clinical biochemistry from the University of Cambridge.



### Jitendra Mangwani

Jitendra Mangwani is a Consultant Orthopaedic Foot and Ankle Surgeon at University Hospitals of Leicester. He graduated in India and completed his higher surgical training in trauma and orthopaedics in London with a specialist fellowship in foot and ankle surgery. He has a keen research interest. He is committed to medical education and is regularly invited as a faculty to courses and conferences. He runs both national and international foot and ankle surgery courses. He is a member of the Scientific Committee and in this role is co-opted on the Outcomes Committee.





### Dr Deborah Modha

I am a Consultant Medical Microbiologist and Head of Service for the department of Clinical Microbiology at the University hospitals of Leicester. I have a number of specialist interest areas which includes the Microbiology and management of infections in patients with diabetes notably diabetic foot infections. I regularly attend the specialist diabetic foot MDT clinics and have been an active member of the specialist diabetic foot team since 2010. During this time I have been responsible for developing the infection service to this group of patients, introducing updated and expanded guidelines, introducing outpatient IV antibiotic services before the introduction of the formal UHL OPAT service and improved microbiology diagnostic services. I have worked with the team especially podiatric surgery and orthopaedic colleagues in novel approaches to the management of diabetic foot osteomyelitis using minimal debridement and calcium sulphate delivered local antibiotics of which our primary work has been published.



### Dr Anton Pick

Dr Anton Pick is a consultant in Rehabilitation Medicine and Clinical Lead of the Oxford Centre for Enablement (OCE). He is also medical lead for the multidisciplinary spasticity management service there.

The OCE is a stand-alone, 'one-stop-shop' rehabilitation centre on the site of the Nuffield Orthopaedic Centre, providing integrated inpatient neurological rehabilitation, outpatient multidisciplinary rehabilitation, orthotics and prosthetics, electronic assistive technology, a dedicated tertiary referral posture management and seating service, rehabilitation engineering and complex spasticity management.



### Bill Ribbans

Bill Ribbans is a Consultant Orthopaedic Surgeon based in Northampton. He undertook Fellowships in Sheffield and at Harvard before becoming a Consultant at the Royal Free, London in 1991. Five years later he returned to his home town in Northampton, where he continues to work – the last 7 years have been in full-time private practice. He has a personal chair in Sports Medicine at the University of Northampton, is CMO for Northamptonshire Cricket, and Honorary Surgeon to a number of Sporting Organisations including the English National Ballet and Northampton Town FC. . Bill has been involved clinically in elite sport since 1981. Bill has over 140 scientific publications and lectures widely both nationally and internationally. His research interests including outcomes in foot and ankle surgery, the genetics of ligament and tendon injury, Vitamin D activity in the musculoskeletal sphere, cryotherapy in recovery and rehabilitation, the ethics of sports medicine and sports injury surveillance.



### James Ritchie

James studied at Guy's and St Thomas's Medical School and, in a desperate attempt to expunge the intellectual tedium of the Krebs cycle, in the History faculty at UCL. Returning to medicine with all the enthusiasm of a dendrophobic lumberjack he undertook his higher surgical training in the South-East Thames Programme, and fellowships in London, before being appointed a Consultant Foot and Ankle Surgeon in 2005.

Despite the extensive demands upon his time made by both the healing of the sick and his unfeasibly large number of children, James has managed to maintain his interest in History in general, and History of Medicine in particular. He has written and presented on a wide range of topics including The Impact of the European Black Death, Vesalius and the Renaissance Anatomists, and From Trench to Breezy Brighton: Medicine at the Front and in the Rear in World War One.

James is still practising Foot and Ankle Surgery in Tunbridge Wells; the cloud of effortless superiority once occupied by old-school Consultants continues to elude him.

### Roland Russell

Having trained with a number of eminent foot and ankle specialists in the UK, United States and France, Andrew 'Fred' Robinson took up a post at Cambridge University Hospital as a Consultant in Orthopaedics and Trauma.

Fred has run the foot and ankle service in Cambridge since 1999. He served as President of the British Orthopaedic Foot & Ankle Surgical Society in 2010-11. Over the years, he has undertaken a broad range of foot and ankle surgery and has built a national and international reputation for his foot and ankle surgical care. He has published three chapters in various Oxford textbooks in Medicine and has now published over 50 articles referenced on PubMed.

Fred's clinical practice covers the full range of foot and ankle surgery. He treats both trauma and orthopaedic conditions of the foot and in the National Health Service runs the very foot and ankle surgery service at Addenbrooke's.

### Roland Russell

Roland Russell is a consultant orthopaedic surgeon at Broomfield Hospital, Chelmsford where he heads the foot and ankle unit and is clinical lead in orthopaedic research. He has established strong links with The Anglia Ruskin University where he is involved in ongoing foot and ankle research. Roland qualified at The London Hospital and trained on the North West Thames Rotation. He has undertaken both national and international foot and ankle fellowships and is a reviewer of the European Journal, Foot and Ankle Surgery.

### Ian Sharpe

Ian Sharpe has been a consultant orthopaedic foot and ankle surgeon at the Princess Elizabeth Orthopaedic Centre, Exeter since 2003. He graduated from St Mary's Hospital Medical School in 1991, and completed his orthopaedic training on the Far South West rotation, undertaking further clinical and research fellowships in Sydney and Seattle. He established the foot and ankle unit in Exeter and was Lead Clinician for Trauma from 2006-10, and was Clinical Director from 2014-2018. He has developed at particular interest in primary and revision ankle replacement techniques. He is a member of the BOFAS Education Committee.

### Dr Jane Simmonds MCSP MMACP SFHEA

DProf, MA, PGDip, PGCHE, BApp Sc, BPE

With more than 25 years of clinical experience, Jane combines her role Physiotherapy Lead at the London Hypermobility Unit with leading the MSc in Paediatric Physiotherapy at University College London. Jane is an active researcher and has authored more than 50 research and clinical education publications including 6 book chapters. Research and clinical interests include hypermobility, Ehlers Danlos syndromes, bone health, dysautonomia, chronic fatigue and sports injuries. She is the Chair of international Ehlers Danlos Syndrome Allied Health working group and a member of the Scientific and Medical Board of the Ehlers Danlos Society. Jane is a physiotherapy advisor to the Hypermobility Syndromes Association, Ehlers Danlos Support UK and PoTS UK.





### Hiro Tanaka

Hiro Tanaka is a consultant orthopaedic surgeon in Newport, South Wales. He is passionate about improving the quality of surgical training and promoting clinical leadership in the NHS. He designed the BOFAS Principles Course on behalf of the Education Committee in 2010 and continues to be a member of the committee. He is Chairman of the Education and Revalidation Committee of the BOA and is an examiner for the FRCS (Orth).



### Heath Taylor

Heath Taylor graduated from Charing Cross & Westminster Medical School in 1994 and completed his Orthopaedic training on the North West Thames training rotation. He carried out his fellowship in complex foot and ankle surgery at The Royal National Orthopaedic Hospital, Stanmore. He is currently a Consultant Orthopaedic Surgeon specialising in Foot & Ankle surgery at The Royal Bournemouth & Poole Hospitals. He takes a particular interest in training the next generation of orthopaedic surgeons and in 2012 was voted the Wessex Region Trainer of the Year. Heath is serving his second term as BOFAS Treasurer.



### Dave Townshend

Mr Townshend was appointed to the Northumbria NHS Trust in 2010. He trained in the Northern Deanery with a fellowship at the University of British Columbia, Vancouver. He is the sub-speciality lead for clinical research in the North East and Cumbria with a research interest in ankle arthritis. He was appointed to the BOFAS Scientific Committee in 2016.



### Chris Walker

Chris Walker is a Consultant Orthopaedic Surgeon with extensive experience in foot and ankle surgery. He undertook his surgical training in London and Liverpool. Prior to taking up his Consultant post he visited foot and ankle centres in the USA at Oakland, Seattle and Baltimore. Following his appointment to the Royal Liverpool University Hospital in 1994, he undertook an Ilizarov Fellowship in Kurgan. He has built a dynamic team over the years and the unit has been designated jointly, a Centre of Excellence for foot and ankle surgery with international surgeons visiting to observe and discuss surgery. Chris runs a BOFAS registered senior Fellowship for surgeons and regularly lectures at national and international meetings. He was President of the British Orthopaedic Foot and Ankle Society. He has recently been awarded a Fellowship (Ad Eundem) of the Faculty of Sports and Exercise Medicine of the Royal College of Surgeons of Ireland.

### Andrew Walls

I'm a registrar in Northern Ireland deanery and an active member of the WOC-UK trainee committee.

My strong interest in global health has led to many trips abroad with orthopaedic objectives over the last twelve years and this is a theme I plan to keep going. In August 2018 with the help of a BOFAS grant, I took six months out of my training to work in Blantyre Malawi with my wife Emma. For the first time, I saw Orthopaedics through a different lens. For me it was not only an opportunity to teach, but an opportunity to learn. I plan to finish my training in the next 2 years and with an interest in Foot & ankle and Limb reconstruction.



### Guy Wansbrough

Mr Wansbrough trained as a doctor at Guy's Medical School and then as an Orthopaedic surgeon on the Southwest Higher Training Programme. He gained a Fellowship of the Royal College of Surgeons in 2008. He subsequently undertook post-fellowship speciality training in the fields of trauma, limb reconstruction and paediatric orthopaedics in Brisbane, Australia and foot and ankle surgery with one of the UK's leading surgeons in that field in Oxford.

Mr Wansborough was appointed as full time foot and ankle and trauma surgeon at Torbay hospital in February 2011 and continues to work as locum consultant Paediatric Orthopaedic surgeon at the Royal Devon and Exeter Hospital.



### Dr Lizzy Weigelt

Lizzy Weigelt graduated from the Technical University Hospital in Munich, Germany in 2013 and completed her specialization training in Zurich, Switzerland. She was appointed as a consultant orthopaedic surgeon in 2019 before starting a fellowship in foot and ankle surgery at Aintree University Hospital, Liverpool with Mr Andrew Molloy in August 2019. She is going to be a consultant orthopaedic foot and ankle surgeon at Balgrist University Hospital in Zurich, Switzerland after her return in August 2020.



### Mr R Lloyd Williams

Mr R Lloyd Williams is a consultant orthopaedic surgeon specialising in foot and ankle disorders. He also treats general trauma.

Mr Williams is a founding partner of the London Orthopaedic Clinic and a pioneer in Minimally Invasive Surgery (MIS) techniques in the field of Foot and Ankle Surgery.



### Tim Williams

Tim Williams undertook his Orthopaedic Training in London and Eastern England before a fellowship in Stanmore 2010. He has been a consultant in Colchester since 2011 where he has built upon the MDT Foot & Ankle team established by the late David Moore. He works closely with the Military Garrison in Colchester enjoying the work a parachute regiment brings.

As an educationalist regionally and nationally Tim is serving his second term on the BOFAS Education Committee. Convenor of the Principles Course in Cambridge 2018 he joined other members taking this course to Ethiopia in 2019. A recent passion has been promoting overseas bursaries for visitors to Conference, welcoming colleagues from Bangladesh, Ghana, India and more. In 2017 he set up and ran the now regular Fellows Forum session at Conference and this year leads in the 'brave new world' of the Conference Blog!



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# BOSFAS

## PROGRAMMES

# DAY 1: WEDNESDAY 13TH NOVEMBER

Time	Event	Speaker
08:00-08:50	Registration	
08:50-09:00	Welcome	Patricia Allen
09:00-10:45	<b>INSTRUCTIONAL 1 – DIABETIC FOOT</b> <i>Chairs: Alistair Best   Callum Clark</i>	
09:00-09:10	A multidisciplinary approach	Rajesh Jogia
09:10-09:35	Medical advances in the diabetic foot	Mike Edmonds
09:20-09:50	When to intervene? – ulcers	Con Loziou
09:50-10:05	When to be intervene and how aggressive to be - Charcot	Venu Kavarthapu
10:05-10:20	When is enough enough?	Fred Robinson
10:20-10:45	Discussion	
10:45-11:15	Coffee/Tea (Exhibition area)	
11:15-11:40	<b>KEYNOTE LECTURE 1</b> Control of Infection in Diabetic Foot Disease	Dr Deborah Modha
11:45-13:00	<b>FREE PAPERS 1</b> <i>Chairs: Maneesh Bhatia   Roland Russell</i>	
13:00-14:00	Lunch (Exhibition area)	
14:00-14:50	<b>INSTRUCTIONAL 2 – RESEARCH / OUTCOMES IN ORTHOPAEDICS</b> <i>Chairs: Patricia Allen   Roland Russell</i>	
14:00-14:10	JLA update	Jit Mangwani
14:10-14:45	Oxford FAME study – Q&A <i>Chair: Steve Hepple</i>	Xavier Griffin Chris Blundell
14:45-15:00	Your research ideas from the floor – an open forum for you	
15:00-15:15	Podiatry update	Fred Robinson
15:15-15:45	Coffee/Tea (Exhibition Hall)	

Notes:

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# DAY 1: WEDNESDAY 7TH NOVEMBER

Time	Event	Speaker
15:45-17:00	<b>INSTRUCTIONAL 3 – RARE BUT REGULAR: WHAT TO DO?</b> <i>Chairs: Rick Brown   Nick Cullen</i>	
15:45-15:55	AVN talus	Mark Davies (Sheff)
15:55-16:05	Muller Weiss	Chris Walker
16:05-16:10	Discussion	
16:10-16:20	Ehlers Danlos Syndrome	Helen Cohen
16:20-16:30	Surgery in hypermobility	Lloyd Williams
16:30-16:35	Discussion	
16:35-16:45	Post stroke/MS contractures	Anton Pick (Oxford)
16:55-16:55	Tenosynovial Giant Cell Tumour of the Foot & Ankle: A new name for a difficult problem?	Rob Ashford
16:55-17:00	Discussion	
17:00-17:25	Historical Lecture: "Every Tale Condemns Me for a Villain: In Search of the Historical Richard III"	James Ritchie
17:25-17:50	What do Richard IIIs bones tell us about his life?	Jo Appleby
18:00-19:00	Poster Viewing and Drinks Reception	Exhibition Area

Notes:

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# DAY 2: THURSDAY 14TH NOVEMBER

Time	Event	Speaker
<b>SESSION 1:</b>		
<b>MAIN AUDITORIUM</b>		
09:00-09:20	<b>NJR UPDATE/OUTCOMES</b> <i>Chairs: Nikki Kelsall   Tim Williams</i>	
	NJR update NCIP	Andy Goldberg Gareth Jones
09:20-09:35	<b>TAR - SETTING UP A LOCAL NETWORK</b>	Paul Halliwell Rick Brown
09:35-10:30	Diabetic foot service provision <i>Chairs: Nikki Kelsall   Tim Williams</i>	
	The current state of affairs The realities of service provision: a 'hub' hospital experience The realities of service provision: a 'spoke' hospital experience Open discussion – how do we engage the foot and ankle/orthopaedic community?	Tricia Allen Fred Robinson Nikki Kelsall
10:30-11:00	Coffee/Tea (Exhibition area)	
11:00-12:00	'Reflections from a career in foot and ankle surgery' <i>Chairs: Rick Brown/Anna Chapman</i>	
11:00-11:30	Hiro Tanaka interviews Kartik Hariharan	
11:30-12:00	Rick Brown interviews Paul Cooke	
<b>SESSION 2:</b>		
09:00-12:00	<b>AHP MEETING</b>	
<b>SESSION 3:</b>		
08:30-12:00	<b>INDUSTRY WORKSHOPS</b>	
10:30-11:00	Coffee/Tea (Exhibition area)	
12:00-13:00	Lunch (Exhibition area)	
12:45/13:00-14.30	<b>PARALLEL SESSIONS</b>	

# DAY 2: THURSDAY 14TH NOVEMBER

Time	Item	Speaker
<b>SESSION 1:</b>		
<b>MAIN AUDITORIUM</b>		
12:45-14:30	<b>AGM - BOFAS FULL MEMBERS ONLY PRESIDENTIAL HANDOVER</b>	
<b>SESSION 2:</b>		
13:00-14:30	<b>AHP SESSION 2</b>	
<b>SESSION 3:</b>		
12:40-14:20	<b>REGISTRARS/FELLOWS SESSION</b>	
14:20-15:00	Coffee/Tea (Exhibition area)	
15:00-15:45	<b>FREE PAPERS 2</b> <i>Chairs: Raman Dega   Jit Mangwani</i>	
15:45-16:10	<b>KEYNOTE LECTURE 2: CRPS</b>	Roger Atkins
16:10-16:35	<b>KEYNOTE LECTURE 3: VITAMIN D IN ORTHOPAEDICS</b>	Bill Ribbans
16:40-17:55	<b>INSTRUCTIONAL 4: METABOLIC</b> <i>Chairs: Callum Clark   Ian Sharpe</i>	Bill Ribbans
16:40-16:55	Nicotine and Bones: an unhappy union?	Hiro Tanaka
16:55-17:10	NSAIDs and Bone healing: what is the evidence?	Robert Clayton
17:10-17:25	Anorexia/ Osteoporosis	Veena Patel
17:25-17:40	Obesity and outcomes	Heath Taylor
17:40-17:55	Discussion	



# DAY 2: AHP PROGRAMME

## THURSDAY 14TH NOVEMBER

Time	Event	Speaker
09:00- 09:10	Introduction	Noelene Davey/ Howard Davies
	<b>PLANTAR PLATE</b> <i>Chair: Raman Dega &amp; Jodie Breach</i>	
09:10- 09:20	Anatomy of the plantar plate	Kartik Hariharan
09:20-09:30	Radiology of plantar plate ruptures	Nik Kotnis
09:30-09:45	Podiatric/biomechanical assessment and management	Kevin Bruce
09:45-10:05	Surgical repair of plantar plate ruptures	Nick Cullen
10:05-10:20	Intrinsics of the foot and influence on hallux valgus	Darren James
10:20-10:30	Discussion	
10:30-11:00	Coffee (in main exhibition room)	
11:00-12:00	Complex case presentations/ Discussion <i>(Panel including: Jane Simmonds, Noelene Davey, Jit Mangwani, Nick Cullen)</i>	
12:00-13:00	Lunch (in main exhibition room)	
	<b>EHLERS-DANLOS</b> <i>Chair: Sylvia Wojceichowski &amp; Howard Davies</i>	
13:00-13:30	Ehlers Danlos- Diagnosis and medical management	Helen Cohen
13:30-14:00	Role of physiotherapy in the management of ED in the foot and ankle	Jane Simmonds
14:00-14:20	Role of podiatry/ orthotics in the management of ED	Justin Coulter
14:20-14:30	Discussion and close	
14:30	Coffee (in main exhibition room)	

# DAY 2: FELLOWS PROGRAMME

## THURSDAY 14TH NOVEMBER

Time	Item	Speaker
12.40	Introduction	Miss. Charlotte Angel Miss. Lizzy Weigelt
	<b>BOFAS FOOT AND ANKLE FELLOWSHIP EXPERIENCE</b>	
12.45	Preparing for on overseas fellowship	Mr. Edward Gee
12.53	Fellowships in the developing world	Mr. Andrew Walls
13.01	Visitation fellowships	Mr. Togay Koc
13.09	Questions	Panel
	<b>PREPARING FOR A CONSULTANT POSITION</b>	
13.20	Getting the basics right	Mr. John Grice
13.30	Managerial Expectations	Mr. Andrew Furlong
13.40	Teaching and Training in the Consultant role	Mr. Simon Hodkinson
13:50	Research as a Consultant	Mr. Andrew Goldberg OBE
14:00	Questions	Panel
	<b>WHAT CAN BOFAS DO FOR YOU?</b>	
14.10	Courses, bursaries & opportunities	Mr. Tim Williams
14.20	Close	





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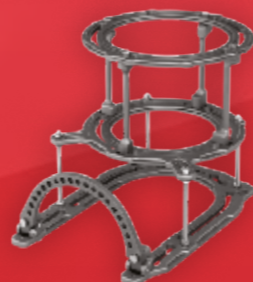
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# B\$FAS

## FREE PAPERS ABSTRACT SUMMARY

# FREE PAPERS 1

Wednesday 13th November 2019

## FP1

### Cartiva synthetic cartilage implant hemiarthroplasty for treatment of hallux rigidus

B. Brandao<sup>1</sup>, A. Aljawadi<sup>2</sup>, A. Fox<sup>2</sup>, A. Pillai<sup>2</sup>

<sup>1</sup>University of Manchester, Manchester, United Kingdom,

<sup>2</sup>Manchester University NHS Foundation Trust, Manchester, United Kingdom

## FP2

### Long term clinical results of hallux varus correction by a reversed abductor hallucis transfer

K. Schwagten<sup>1</sup>

<sup>1</sup>NHS West Suffolk, O & T, Bury St Edmunds, Belgium

## FP3

### Outcome and complications after cheilectomy for hallux rigidus at an average of 6 years

L. Sinan<sup>1,2</sup>, E. Kokkinakis<sup>1</sup>, C. Senthil Kumar<sup>1</sup>

<sup>1</sup>Glasgow Royal Infirmary, Glasgow, United Kingdom,

<sup>2</sup>University of Glasgow, Glasgow, United Kingdom

## FP4

### Patients expectations versus their functional outcomes after hallux valgus corrective surgery: a prospective study

S. Yousaf<sup>1</sup>, S. Jeong<sup>1</sup>, P. Hamilton<sup>1</sup>, A. Sott<sup>1</sup>

<sup>1</sup>Epsom and St. Helier University Hospitals NHS Trust, Trauma and Orthopaedics, Epsom, United Kingdom

## FP5

### Five-year outcomes after ankle fracture fixation in a UK teaching hospital

H.H. Chong<sup>1</sup>, N. Banda<sup>1</sup>, M. Hau<sup>1</sup>, P. Rai<sup>1</sup>, J. Mangwani<sup>1</sup>

<sup>1</sup>University Hospital of Leicester, Trauma & Orthopaedic, Leicester, United Kingdom

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## FP6

### Fibular nails - Is this the answer to ankle fracture fixation?

S. Gandham<sup>1</sup>, E. Leong<sup>2</sup>, S. McDonnell<sup>2</sup>, A. Molloy<sup>1,3</sup>, L. Mason<sup>1,3</sup>, A. Robinson<sup>2</sup>

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<sup>2</sup>Addenbrooke's Hospital, Cambridge,

United Kingdom, <sup>3</sup>University of Liverpool, Liverpool, United Kingdom

## FP7

### Early Motion And Directed Exercise (EMADE) versus usual-care, post ankle fracture fixation: 12 and 24-week results from a pragmatic randomised controlled trial

P. Matthews<sup>1,2</sup>, B. Scammell<sup>1</sup>, A. Ali<sup>1</sup>, J. Nightingale<sup>1,3</sup>, T. Coughlin<sup>1</sup>, T. Khan<sup>1</sup>, B. Ollivere<sup>1,3</sup>, Orthopaedics and Trauma Group, University of Nottingham, UK

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## FP8

### Charcot neuroarthropathy: surgical outcomes following hind and midfoot reconstruction. A minimum 12 month follow up from a tertiary hospital

J. Giddie<sup>1</sup>, N. Physo<sup>2</sup>, I. Reichert<sup>2</sup>, R. Ahluwalia<sup>2</sup>, V. Kavarthapu<sup>2</sup>

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## FP9

### Infected charcot ankle neuroarthropathy, any hope before amputation? A prospective study

A.E. Galhoum<sup>1,2</sup>, M.M. Abd-Ella<sup>3</sup>, M. ElGebeily<sup>3</sup>, A.F. Abdel Rahman<sup>3</sup>, H. El Zahlawy<sup>3</sup>, A. Ramadan<sup>2</sup>,

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## FREE PAPERS 2

Thursday 14th November 2019

### FP10

#### **Autologous Osteochondral Transplantation for large osteochondral lesions of the talus is a viable option in an athletic population**

L. McMenemy<sup>1,2</sup>, A. Nguyen<sup>3</sup>, A. Ramasamy<sup>1,2,3</sup>, M. Walsh<sup>3</sup>, J. Calder<sup>1,3</sup>

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<sup>2</sup>Royal Centre for Defence Medicine, Academic Department for Military Surgery and Trauma, Birmingham, United Kingdom,

<sup>3</sup>Fortius Clinic, London, United Kingdom

### FP11

#### **Identification of healthy and tendinopathic cell sub-types in foot and ankle tendons using single cell transcriptomics**

A. Kendal<sup>1,2</sup>, R. Brown<sup>2</sup>, C. Loizou<sup>2</sup>, M. Rogers<sup>2</sup>, R. Sharp<sup>2</sup>, A. Carr<sup>1</sup>

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### FP12

#### **Comparing MIS to open calcaneal osteotomy: are they benign procedures?**

B.P. Tweedie<sup>1</sup>, D. Townshend<sup>2</sup>, J. Coorsh<sup>2</sup>, A. Murty<sup>2</sup>, R. Kakwani<sup>2</sup>

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<sup>2</sup>Northumbria Healthcare NHS Foundation Trust, Northumberland, United Kingdom

### FP13

#### **Lateral transligamentous approach to the talar dome**

L.-A. Lambert<sup>1</sup>, M. Davies<sup>2</sup>, J. Mangwani<sup>3</sup>, A. Molloy<sup>1</sup>, L. Mason<sup>1</sup>

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### FP14

#### **Evaluating short term outcomes post intra-articular calcaneal fracture fixation via a Sinus Tarsi approach in a non-exclusively selected cohort**

M. Davey<sup>1</sup>, P. Stanton<sup>1</sup>, L.A. Lambert<sup>1</sup>, T. McCarton<sup>1</sup>, J. Walsh<sup>1</sup>

<sup>1</sup>Beaumont Hospital, Department of Trauma & Orthopaedics, Dublin, Ireland

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## FREE PAPERS 3

Friday 15th November 2019

### FP15

#### **Outcome of revision surgery for failed ankle arthroplasty: revision arthroplasty vs arthrodesis**

A. Egglestone<sup>1</sup>, R. Kakwani<sup>1</sup>, A.N. Murty<sup>1</sup>, D. Townshend<sup>1</sup>

<sup>1</sup>Northumbria Healthcare NHS Foundation Trust, Trauma and Orthopaedics, Newcastle Upon Tyne, United Kingdom

### FP16

#### **Trends in total ankle replacement in Scotland**

T.T. Ha<sup>1</sup>, Z. Higgs<sup>1</sup>, C. Watling<sup>2</sup>, C.S. Osam<sup>2</sup>, N.J. Madeley<sup>3</sup>, C.S. Kumar<sup>3</sup>

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### FP17

#### **Early outcomes of revision total ankle arthroplasty using the INBONE II and INVISION systems**

T. Batten<sup>1</sup>, N. Talbot<sup>1</sup>, I. Sharpe<sup>1</sup>

<sup>1</sup>Royal Devon & Exeter Hospital, Trauma & Orthopaedics, Exeter, United Kingdom

### FP18

#### **The role of rotation in total ankle replacement**

A.-A. Najefi<sup>1</sup>, Y. Ghani<sup>1</sup>, A. Goldberg<sup>1,2,3</sup>

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### FP19

#### **The Hintegra Total Ankle Replacement: survivorship, failure modes and patient reported outcomes in 70 consecutive cases with a minimum 5 year follow up**

L. Clifton<sup>1</sup>, A. Kingman<sup>2</sup>, P. Rushton<sup>1</sup>, A. Murty<sup>3</sup>, R. Kakwani<sup>1</sup>, J. Coorsh<sup>1</sup>, D. Townshend<sup>1</sup>

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FP20

**Pes cavovarus in Charcot-Marie-Tooth compared to the idiopathic cavovarus foot: a preliminary weightbearing CT analysis**

A. Bernasconi<sup>1</sup>, L. Cooper<sup>1</sup>, S. Lyle<sup>1</sup>, S. Patel<sup>1</sup>, N. Cullen<sup>1</sup>, D. Singh<sup>1</sup>, M. Welck<sup>1</sup>  
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FP21

**Risk of saphenous nerve injury during syndesmotic stabilisation with the TightRope technique**

R. Morrell<sup>1</sup>, S. Abas<sup>1</sup>, R. Kakwani<sup>1</sup>, D. Townshend<sup>1</sup>  
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FP22

**Day Case Total Ankle Replacement**

B. Drake<sup>1</sup>, M. Blundell<sup>1</sup>, B. Gibson<sup>1</sup>, A. Kingman<sup>1</sup>, R. Kakwani<sup>1</sup>, D. Townshend<sup>1</sup>  
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FP23

**The deep deltoid ligament and stability after ankle fracture: a cadaveric study**

D. McCormack<sup>1</sup>, S. Kirmani<sup>1</sup>, S. Aziz<sup>1</sup>, R. Faroug<sup>1</sup>, M. Solan<sup>2</sup>, J. Mangwani<sup>1</sup>  
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# BOSFAS

## FREE PAPERS ABSTRACT DETAILED

## ... Think Arthrex

# FREE PAPER SESSION 1

Wednesday 13th November

## FP1

### Cartiva synthetic cartilage implant hemiarthroplasty for treatment of hallux rigidus

B. Brandao<sup>1</sup>, A. Aljawadi<sup>2</sup>, A. Fox<sup>2</sup>, A. Pillai<sup>2</sup>

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**Objectives:** Cartiva synthetic cartilage implant (SCI) is licenced for use in management of symptomatic hallux rigidus in several countries including the UK. As for now, there are no independent comparative series for treatment of hallux rigidus utilising polyvinyl alcohol implants.

**Study design and methods:** Patients at a single centre with symptomatic hallux rigidus who underwent Cartiva SCI implant procedure were identified. First metatarsophalangeal joint arthritis was radiographically graded according to the Hattrup and Johnson (HJ) classification. Pre-operative and post-operative patient-reported outcomes were evaluated using the Foot and Ankle Ability Measure (FAAM) activities of daily living subscale and the Manchester-Oxford Foot Questionnaire (MOXFQ).

**Results:** 66 patients (19M, 47F) (43R and 23L) were followed up for an average of 14 months (min=2, max=36). 17 patients suffered from HJ2/moderate arthritis and 49 patients with grade HJ3/severe arthritis.

Post-operative mean FAAM scores showed statistically significant improvement ( $p < 0.0001$ ). Patients reported a 40% increase in functionality during activities of daily living.

All 3 MOXFQ Domain scores improved significantly ( $p < 0.02$ ). The Index score improved by 28 points ( $p < 0.0001$ ).

There was no correlation between length of follow up or age and PROMs ( $r = 0.129$ ). No statistical difference was demonstrated between sexes. However clinically, males and older patients exhibit better outcomes.

There was a 89.4% patient satisfaction with the use of Cartiva.

**Conclusions:** Our study shows excellent results with statistically significant improvements in functional outcomes, and promising short-term follow-up with low early revision rates. Pain in particular was significantly reduced. One third of patients developed post-operative stiffness requiring a manipulation under anaesthesia. Patient selection is key. Additional imaging may be required to assess sesamoid osteoarthritis. At 3 years the implant has demonstrated to be safe and efficacious in the management of hallux rigidus. Durability and survivability of the implant will continue to be studied in this cohort.

## FP2

### Long term clinical results of hallux varus correction by a reversed abductor hallucis transfer

K. Schwagten<sup>1</sup>

<sup>1</sup>NHS West Suffolk, O & T, Bury St Edmunds, Belgium

**Background:** Iatrogenic hallux varus is a rare complication after hallux valgus surgery. Operative treatment comprises a wide variety of techniques, of which the reversed transfer of the abductor hallucis tendon is the most recent described technique.

**Methods:** This paper will present the long-term clinical results of the reversed transfer of the abductor hallucis longus. Therefore, we performed a prospective clinical observational study on 16 female patients. Our hypothesis is that the tendon transfer will persist in a good alignment and patient satisfaction on long term. There is a 100% follow-up rate with a range from 10 to 101 months. Patients were subjected to a clinical examination, three questionnaires and their general satisfaction.

**Results:** Out of 16 patients, at time of follow-up, we found a positive correlation between the subjective outcome score and alignment ( $r = 0.59$ ), and between the general satisfaction and alignment ( $r = 0.77$ ). Based on the general satisfaction we achieved a success satisfaction rate of 69% (11 patients). The other 31% (5 patients) patient group was only satisfied with major reservations or not satisfied at all. The two most invalidating complications were a coronal or sagittal malalignment or the combination of both.

**Conclusion:** Our results suggest that the reverse abductor hallucis tendon transfer is a good technique to treat a supple iatrogenic hallux varus with an observed success satisfaction rate of 69% at a mean follow-up time of 48 (range 10-101) months. However, patients should be informed that on the long-term loss of correction is possible.

## FP3

### Outcome and complications after cheilectomy for hallux rigidus at an average of 6 years

L. Sinan<sup>1,2</sup>, E. Kokkinakis<sup>1</sup>, C. Senthil Kumar<sup>1</sup>

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**Introduction:** Cheilectomy is a recommended procedure for the earlier stages of osteoarthritis of the 1st metatarsophalangeal joint. Although good improvement in symptoms have been reported in many studies, the long term performance of this procedure is not well understood. It is thought that a significant number of patients go onto have arthrodesis or joint replacement. We report on a large cohort of patients who received this procedure and report on the complications and mid-term outcome.

**Methods:** This is a retrospective study looking at all patients who underwent cheilectomy for hallux rigidus between November 2007 and August 2018. Departmental database was used to access patient details and outcome measures recorded include: postoperative wound infection, patient reported improvement in pain and the incidence of further surgical interventions like revision cheilectomy and conversion to arthrodesis and arthroplasty. X-rays were studied using PACS to stage the osteoarthritis (Hattrup and Johnson classification).

**Results:** A total of 240 feet in 220 patients (20 bilateral surgeries) were included in the study, there were 164 Females (75%) and 56 Males (25%), the median age was 55 years (range 22-90 years). Radiological assessment showed 89 Stage 1 arthritis(42%), 105 Stage 2 (50%), 17 Stage 3 (8%) and 9 patients were excluded due to unavailable X-rays. 5 patients (2%) had superficial wound infection. There were 16 further surgeries (7%) performed in this cohort, 12 arthrodesis (5%), 3 revision cheilectomy and 1 conversion to arthroplasty. 157 patients were found to be pain-free at the latest post-operative visit (77%), 48 reported minimal pain (23%), 15 patients were excluded due to unavailable data.

**Conclusion:** Cheilectomy appears to produce good improvement in pain with a low complication rate. The rate of conversion to arthrodesis/arthroplasty is lower than in many reported studies.

## FP4

### Patients expectations versus their functional outcomes after hallux valgus corrective surgery: a prospective study

S. Yousaf<sup>1</sup>, S. Jeong<sup>1</sup>, P. Hamilton<sup>1</sup>, A. Sott<sup>1</sup>

<sup>1</sup>Epsom and St. Helier University Hospitals NHS Trust, Trauma and Orthopaedics, Epsom, United Kingdom

**Purpose:** To explore the relationship in terms of time scale between pre-operative expectations and postoperative outcomes and satisfaction after Hallux valgus surgery.

**Methods:** A patient derived questionnaire was developed and 30 patients aged 19 to 67 were included undergoing primary hallux valgus correction with a first metatarsal osteotomy and distal soft tissue release. Patients were asked pre-operatively to quantify their expected time scale for improvement in pain, ability to walk unaided, ability to drive, routine foot wear and foot feeling normal at 6 weeks, 3 and 6 months following surgery, and to indicate their confidence in achieving this result. Patients recorded postoperative outcomes achieved at number of weeks. Ordinal logistic regression multivariate modelling was used to examine predictors of postoperative satisfaction.

**Results:** 90% of the patients were able to walk unaided and drive before or around the expected time scale at an average of five weeks' time. Persistent pain subsided at an average of two weeks post operatively which led to high satisfaction. Although differences between patients' expectation and achievement were minimal at 6 weeks post-operatively, there was some discrepancy at 3 months, with patient expectations far exceeding achievement. The least satisfactory outcome was normal feeling of foot at six months follow up. There were significant correlations between failure to achieve expectations and the importance patients attached to recovery.

**Conclusions:** This study underlines the importance of taking preoperative expectations into account to obtain an informed choice on the basis of the patient's preferences. Patients' pre-operative expectations of surgical outcome exceed their functional achievement but satisfaction remains high if pain control and ability to walk unaided is achieved early after hallux valgus corrective surgery.



## FP5

### Five-year outcomes after ankle fracture fixation in a UK teaching hospital

H.H. Chong<sup>1</sup>, N. Banda<sup>1</sup>, M. Hau<sup>1</sup>, P. Rai<sup>1</sup>, J. Mangwani<sup>1</sup>

<sup>1</sup>University Hospital of Leicester, Trauma & Orthopaedic, Leicester, United Kingdom

**Introduction:** Ankle fractures represent approximately 10% of the fracture workload and are projected to increase due to ageing population. We present our 5 years outcome review post-surgical management of ankle fractures in a large UK Trauma unit.

**Methods:** A total of 111 consecutive patients treated for an unstable ankle fracture were entered into a database and prospectively followed up. Baseline patient characteristics, complications, further intervention including additional surgery, functional status were recorded during five-year follow-up. Pre-injury and post-fixation functional outcome measures at 2-years were assessed using Olerud-Molander Ankle Scores (OMAS) and Lower Extremity Functional Scales (LEFS). A p value < 0.05 was considered significant.

**Results:** The mean age was 46 with a male:female ratio of 1:1.1. The distribution of comorbidities was BMI >30 (25%), diabetes (5%), alcohol consumption >20U/week (15%) and smoking (26%). Higher BMI was predictive of worse post-op LEFS score (p = 0.02). Between pre-injury and post fixation functional scores at 2 years, there was a mean reduction of 26.8 (OMAS) and 20.5(LEFS). Using very strict radiological criteria, 31 (28%) had less than anatomical reduction of fracture fragments intra-operatively. This was, however, not predictive of patients' functional outcome in this cohort. Within 5-year period, 22 (20%) patients had removal of metalwork from their ankle, with majority 13 (59%) requiring syndesmotic screw removal. Further interventions included: joint injection (3), deltoid reconstruction (1), arthroscopic debridement (1), superficial sinus excision (2), and conversion to hindfoot nail due to failure of fixation (1). Reduction in OMAS was predictive of patients' ongoing symptoms (p=0.01).

**Conclusion:** There is a significant reduction in functional outcome after ankle fracture fixation and patients should be counselled appropriately. Need for removal of metalwork is higher in patients who require syndesmosis stabilisation with screw(s).

## FP6

### Isolated ankle fusion for failed total ankle replacement using a spine cage and anterior plating construct

S. Gandham<sup>1</sup>, E. Leong<sup>2</sup>, S. McDonnell<sup>2</sup>, A. Molloy<sup>1,3</sup>, L. Mason<sup>1,3</sup>, A. Robinson<sup>2</sup>

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**Introduction:** Positive reports from implant designer centres on the use of fibular nails in the complex ankle fractures has resulted in a marked increase in their use nationally. Our aim in this study was to report on the outcomes of the use of all fibular nails in two major trauma centres.

**Methods:** All patients who underwent ankle fracture fixation using a fibular nail in two major trauma centres, were included for analysis. MTC 1 included patients from April 2013 to May 2015, and MTC 2 included patients February 2015 to March 2018. A minimum follow up of 1 year was achieved for all patients. Radiographic reduction was confirmed by Pettrones criteria at time of operation and at 6 weeks and 1 year post-operatively. Kellgren Lawrence radiographic criteria was used to classify osteoarthritis. All complications and further surgery were recorded.

**Results:** Forty-four patients underwent fibular nail fixation in the two centres. The average age was 59 (range 21-91). Using Pettrones criteria, 86% were malreduced at time of operation. A further 34% deteriorated by at least 1 grade by 6 weeks and an additional 16% (n=7) deteriorated by at least 1 grade by 1 year. 57% had developed radiographic evidence of osteoarthritis by 1 year. Only 4.5% (2ankles) maintained complete reduction by 1 year. Other significant complications were reported in 43% of patients.

**Conclusion:** Both major trauma centres report the same experience in the use of fibular nails for ankle fracture fixation. As previously reported in smaller number studies, initial reduction is challenging. Worryingly, the majority of well-reduced lose position with time. We suggest that the fibula nail is used with caution and as part of an appropriately approved audit.

## FP7

### Early Motion And Directed Exercise (EMADE) versus usual-care, post ankle fracture fixation: 12 and 24-week results from a pragmatic randomised controlled trial

P. Matthews<sup>1,2</sup>, B. Scammell<sup>1</sup>, A. Ali<sup>1</sup>, J. Nightingale<sup>1,3</sup>, T. Coughlin<sup>1</sup>, T. Khan<sup>1</sup>, B. Ollivere<sup>1,3</sup>, Orthopaedics and Trauma Group, University of Nottingham, UK

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**Background:** Ankle fractures are extremely common but unfortunately, over 20% fail to obtain good to excellent recovery. For those requiring surgical fixation, usual-care post-surgery has included six-weeks cast immobilisation and non-weightbearing. Disuse atrophy and joint stiffness are detrimental sequelae of this management. While rehabilitation, starting at two-weeks post-surgery is viewed as safe, the literature contains methodological flaws and a lack of focus on early exercise, perpetuating the controversy over the effectiveness of early exercise interventions.

**Objectives:** Our objectives were to determine if following operative fixation for Weber B fracture, the physiotherapy intervention, early motion and directed exercise (EMADE), applied in the clinical setting, were superior to Usual-care at 12-weeks (primary outcome) and 24-weeks.

**Design and Methods:** We undertook a pragmatic-RCT, recruiting 157 surgically fixed Weber B ankle fracture patients, to establish if EMADE was superior to the Usual-care of 6-weeks immobilisation. The EMADE physiotherapy intervention (between week-2 and 4 post-surgery) utilised a removable cast and combined non-weightbearing progressive home exercises with manual therapy, advice and education. The primary outcome measure was the OMAS at 12-weeks.

**Results:** 130 participants returned their 12-weeks post-surgery data, exceeding the 60/group threshold set by the a-priori power calculation. Group OMAS means were; 62.0 and 48.8 (SD 21, 22.5) EMADE, Usual-care respectively, yielding a clinically meaningful mean difference of 13.2 on the OMAS and a statistical difference (95% CI p< 0.001, 5.66 to 20.73). Both clinically meaningful and statistically significant findings were maintained at week-24. There were no intervention related or unexpected adverse events, including instability.

**Conclusions:** This clinic set pragmatic-RCT yielded both clinical and statistical outcomes at week-12 in favour of the EMADE physiotherapy intervention over the Usual-care of 6-weeks immobilisation, in surgically fixed Weber B ankle fracture patients. These positive findings were maintained at week-24 and justify EMADE physiotherapy as a viable treatment option.

## FP8

### Charcot neuroarthropathy: surgical outcomes following hind and midfoot reconstruction. A minimum 12 month follow up from a tertiary hospital

J. Giddie<sup>1</sup>, N. Phyo<sup>2</sup>, I. Reichert<sup>2</sup>, R. Ahluwalia<sup>2</sup>, V. Kavarthapu<sup>2</sup>

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**Background:** Corrective fusion of a deformed / unstable Charcot neuroarthropathy (CN)of the midfoot and hindfoot is performed with the aim to prevent ulcers and maintain patient mobility.

**Methods:** Between October 2007 and July 2018, 103 CN mid and hind foot corrections in 95 patients were performed. There were 34 hind-foot, 38 mid-foot and 31 combined hind and mid-foot surgeries. 83 feet had single stage corrections, whereas 20 required a staged operation.

**Results:** Ninety-five patients were prospectively followed up. The mean patient age in our study was 57 years (21 - 85). Twenty-seven patients had type1 diabetes, 64 patients had type 2 and 4 patients had a neuropathy secondary to other conditions. Forty patients (42%) were offered a below knee amputation prior to attending our foot clinic.

At a mean follow up of 56 months (12- 140) we achieved 100% limb salvage with a 75% full bone fusion rate. There were 17 mortalities within our cohort at a mean period of 3 years. Ninety-seven percent (n=92) patients were mobilizing post-operatively in orthotic footwear.

Fifty-two feet had pre-operative ulcers. Post-operatively 17 feet (16 patients) had persistent ulceration. Eight patients had ulcer resolution following further surgery and alteration of footwear, one patient has been listed for a below knee amputation for unstable non-union, whilst the remaining 7 patients have stable ulcers which are managed with dressings.

Of the 26 feet (25 patients) with non-unions, 6 patients had revision fixation procedures whilst 8 patients required minor surgical procedures. The remaining 11 patients are stable non-unions who are asymptomatic and weight bearing.

Other complications included a deep infection rate of 8% (n=7).

**Conclusion:** We demonstrated a 100% limb salvage rate and an 83% success rate in ulcer resolution. We recommend this be done with the support of the multi-disciplinary team.

## FP9

### Infected charcot ankle neuroarthopathy, any hope before amputation? A prospective study

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**Background:** Charcot neuroarthopathy is a destructive disease characterized by progressive bony fragmentation as a result of the isolated or accumulative trauma in patients with decreased sensation that manifests as dislocation, periarticular fractures and instability. Although amputation can be a reasonable cost economic solution, many patients are willing to avoid that if possible. We explored here one of the salvage procedures.

**Methods:** 23 patients with infected ulcerated unstable Charcot neuroarthopathy of the ankle were treated between 2012 and 2017. The mean age was 63.5 ±7.9 years; 16 males and 7 females. Aggressive open debridement of ulcers and joint surfaces, with talectomy in some cases, were performed followed by external fixation with an Ilizarov frame. The primary outcome was a stable plantigrade infection free foot and ankle that allows weight bearing in accommodative foot wear.

**Results:** Limb salvage was achieved in 91.3% of cases at the end of a mean follow up time of 25 months (range: 19-32). Fifteen (71.4%) solid bony unions were evident clinically and radiographically, while 6 (28.5%) patients developed stable painless pseudoarthrosis. Two patients had below knee amputations due to uncontrolled infection.

**Conclusion:** Aggressive debridement and arthrodesis with ring external fixation can be used successfully to salvage severely infected Charcot arthropathy of the ankle. Pin tract infection, delayed wound healing and stress fracture may complicate the procedure but can be easily managed. Amputation may be the last resort in uncontrolled infection.

Level of evidence: IV prospective case series

## FREE PAPER SESSION 2

Thursday 14th November

## FP10

### Autologous Osteochondral Transplantation for large osteochondral lesions of the talus is a viable option in an athletic population

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Autologous osteochondral transplantation (AOT) is an effective treatment for large Osteochondral Lesions of the Talus (OLT), however little is reported on an athletic population, who are likely to place higher demands on the reconstruction. The aim is to report the outcomes of large OLT (>150mm<sup>2</sup>) within an athletic population.

The study population was limited to professional or amateur athletes (Tegner score >6) with an OLT of size 150mm<sup>2</sup> or greater. The surgical intervention was AOT with a donor site from the lateral femoral condyle. Clinical outcomes at a minimum of 24 months included Return to Sport, VAS and FAOS Scores. In addition, graft incorporation was evaluated by MRI using MOCART scores at 12 months post-surgery.

38 athletes including 11 professional athletes were assessed. Mean follow-up was 46 months. Mean lesion size was 249mm<sup>2</sup>. 33 patients returned to sport at their previous level and one did not return to sport (mean return to play 8.2 months). Visual analogue scores improved from 4.53 pre-operatively to 0.63 post-operatively (p=0.002). FAOS Scores improved significantly in all domains (p< 0.001). Two patients developed knee donor site pain, and both had three osteochondral plugs harvested. Univariate analysis demonstrated no association between pre-operative patient or lesion characteristics and ability to return to sport. However, there was a strong correlation between MOCART scores and ability to return to sport (AUC=0.89).

Our study suggests that AOT is a viable option in the management of large osteochondral talar defects in an athletic population, with favourable return to sport levels, patient satisfaction, and FAOS/VAS scores. The ability to return to sport is predicated upon good graft incorporation and further research is required to optimise this technique. Our data also suggests that patients should be aware of the increased risk of developing knee donor site pain when three osteochondral plugs are harvested.

## FP11

### Identification of healthy and tendinopathic cell sub-types in foot and ankle tendons using single cell transcriptomics

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Tendinopathy can commonly occur around the foot and ankle resulting in isolated rupture, debilitating pain and degenerative foot deformity. The pathophysiology and key cells involved are not fully understood. This is partly because the dense collagen matrix that surrounds relatively few resident cells limits the ability of previous techniques to identify and target those cells of interest. In this study, we apply novel single cell RNA sequencing (CITE-Seq) techniques to healthy and tendinopathic foot/ankle tendons. For the first time we have identified multiple sub-populations of cells in human tendons. These findings challenge the view that there is a single principal tendon cell type and open new avenues for further study.

Healthy tendon samples were obtained from patients undergoing tendon transfer procedures; including tibialis posterior and FHL. Diseased tendon samples were obtained during debridement of intractable Achilles and peroneal tendinopathy, and during fusion of degenerative joints.

Single cell RNA sequencing with surface proteomic analysis identified 10 sub-populations of human tendon derived cells. These included groups expressing genes associated with fibro-adipogenic progenitors (FAPs) as well as ITGA7+VCAM1- recently described in mouse muscle but, as yet, not human tendon. In addition we have identified previously unrecognised sub-classes of collagen type 1 associated tendon cells. Each sub-class expresses a different set of extra-cellular matrix genes suggesting they each play a unique role in maintaining the structural integrity of normal tendon.

Diseased tendon harboured a greater proportion of macrophages and cytotoxic lymphocytes than healthy tendon. This inflammatory response is potentially driven by resident tendon fibroblasts which show increased expression of pro-inflammatory cytokines. Finally, identification of a previously unknown sub-population of cells found predominantly in tendinopathic tissue offers new insight into the underlying pathophysiology. Further work aims to identify novel proteins targets for possible therapeutic pathways.

## FP12

### Comparing MIS to open calcaneal osteotomy: are they benign procedures?

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Lateral approach open calcaneal osteotomy is the described gold standard procedure in the management of hindfoot deformity. With development of minimally invasive surgery, a MIS approach has been described, citing fewer wound complications and lower risk of sural nerve injury. This audit compares MIS to the traditional procedure.

A retrospective review of all patients undergoing calcaneal osteotomy in Northumbria Trust in the past 5 years was performed. A total of 105 osteotomies were performed in 97 patients; 28 (13M:15F) in MIS group and 77 (40M:37F) had an open approach. The average age was 52.1 (range 16-83) for MIS and 51.5 (range 18-83) in the open group. All patients were followed up for development of wound complication, nerve injury and fusion rate.

Wound complications were similar (10.7% in MIS group vs 10.3% in Open group) with no significant difference ( $p=0.48$ ). Patients were treated for infection in 3(3.8%) cases in the open group and 2(7.1%) in the MIS group. This difference was not significant ( $p=0.43$ ). 4 (14.3%) patients in the MIS group had evidence of sural nerve dysfunction post-operatively (managed expectantly), compared to 12(15.5%) patients in the open group ( $p=0.44$ ). Of these, 2 went on to undergo neuroma exploration. There was no difference in nerve dysfunction in varus or valgus correction. Mean translation in the open group was measured as 7.3mm(SD=1.91;3 to 13mm) and 7.5mm(SD=1.25;5 to 10mm) in the MIS group. Translation was similar in varus or valgus correction. Non-union occurred in 2 patients in the MIS group and none in the open group ( $p=0.06$ ).

MIS calcaneal osteotomy is a safe technique, that works as effectively as osteotomy performed through an open approach. There were lower rates of nerve injury, wound complication and infection, but this was not significantly different comparing groups. There was a higher risk of non-union in MIS technique.

## FP13

### Lateral transligamentous approach to the talar dome

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**Introduction:** Anatomic reduction of talar body fractures is critical in restoring congruency to the talocrural joint. Previous studies have indicated a maximum of 25% talar body exposure without malleolar osteotomy. The aim of this study was to investigate the percentage talar body exposure when using the lateral transligamentous approach.

**Methods:** The lateral transligamentous approach to the talus was undertaken in 10 fresh frozen cadaveric specimens by surgeons inexperienced in the approach, following demonstration of the technique. An incision was made on the anterolateral aspect of the ankle augmented by the removal of the anterior talofibular ligament (ATFL) and the calcaneofibular ligament (CFL) from their fibular insertions. A bone lever was then placed behind the lateral aspect of the talus and levered forward with the foot in equinus and inversion.

The talus was disarticulated and high resolution images were taken of the talar dome surface. The images were overlain with a reproducible nine-grid division. Accessibility to each zone within the grid with a perpendicular surgical blade was documented. ImageJ software was used to calculate the surface area exposed with each approach.

**Results:** The mean percentage area of talar dome available through the transligamentous approach was 77.3 % (95% confidence interval 73.3, 81.3). In all specimens the complete lateral talar process was accessible, along with the lateral and dorsomedial aspect of the talar neck. This approach gives complete access to Zones 1,2, 3,5 & 6 with partial access to Zones 4,8 &9.

**Conclusion:** The lateral transligamentous approach to the talus provides significantly greater access to the talar dome as compared to standard approaches. The residual surface area that is inaccessible with this approach is predominantly within Zone 4 and Zone 7, the posteromedial corner.

## FP14

### Evaluating short term outcomes post intra-articular calcaneal fracture fixation via a Sinus Tarsi approach in a non-exclusively selected cohort

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**Aims:** Management of intra-articular calcaneal fractures remains a debated topic in orthopaedics, with operative fixation often held in reserve due to concerns regarding perioperative morbidity and potential complications. The purpose of this study was to identify the characteristics of patients who developed surgical complications to inform the future stratification of patients best suited to operative treatment for intra-articular calcaneal fractures and those in whom surgery was highly likely to produce an equivocal functional outcome with potential post-operative complications.

**Methods:** All patients who underwent open reduction and internal fixation of calcaneal fractures utilizing the Sinus Tarsi approach between March 2014 and July 2018 were identified using theatre records. Patient imaging was used to assess pre- and post-operative fracture geometry with Computed Tomography (CT) used for pre-operative planning. Each patient's clinical presentation was established through retrospective analysis of medical records. Patients provided verbal consent to participation and patient reported outcome measures were recorded using the Maryland Foot Score.

**Results:** Fifty-eight intra-articular calcaneal fractures (fifty-three patients including five bilateral, mean age = 46.91 years) were included. Forty-nine patients were injured as a result of a fall from a height (92.4%). Mean time from presentation to surgery was 3.23 days (range 0-21). Mean Maryland Foot score was found to be 77.6 (+/- 16.22) in forty-five patients. Five patients (9.4%) had wound complications; two superficial (3.7%) and three deep (5.6%).

**Conclusion:** Intra-articular fractures of the calcaneus should be considered for surgical intervention in order to improve long-term functional outcomes. The Sinus Tarsi approach provides the potential to decrease the operative complication rate whilst maintaining adequate fixation, however, the decision to surgically manage these fractures should be carefully

## FREE PAPER SESSION 3

Friday 15th November

### FP15

#### Outcome of revision surgery for failed ankle arthroplasty: revision arthroplasty vs arthrodesis

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**Introduction:** When ankle arthroplasty fails the options are revision to arthrodesis or revision to arthroplasty. We report early outcomes of revision procedures for failed total replacement.

**Methods:** Retrospective review of prospectively collected data including post-operative complications, union, survivorship and PROMS scores to compare revision to arthrodesis and revision to arthroplasty.

**Results:** 31 revision procedures (10 revision to arthrodesis and 21 revision to arthroplasty) were performed for failed primary ankle arthroplasty (30 patients) between January 2012 and June 2019. 23 males: 8 females, average age of 68. Indications for revisions were aseptic loosening (13), cysts/lysis (6), pain (5), periprosthetic infection (3), fracture (2), fibula erosion (1), polyethylene dislocation (1).

Union rate following arthrodesis was 77.9% after primary revision procedure. Impaction bone grafting technique was utilised in seven patients with a union rate of 83%.

Survivorship following revision to arthroplasty was 100% at two years; 87.5% at three years and 75% at four years. Failed revision arthroplasty was revised to arthrodesis successfully..

Median MOxFAQ was 73.5 for the arthrodesis group versus 17 in the arthroplasty group ( $p=0.02$ ). Median AOS was 87 for the arthrodesis group versus 12 for the arthroplasty group ( $p=0.04$ )

**Discussion:** This study demonstrated the potential advantages in the short term of revision arthroplasty over conversion to arthrodesis with statistically significant improvements in MOxFAQ and AOS within the first two years following revision.

### FP16

#### Trends in total ankle replacement in Scotland

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**Introduction:** Total ankle replacement (TAR) is performed for post-traumatic arthritis, inflammatory arthropathy, osteoarthritis and other indications. The Scottish Arthroplasty Project (SAP) began collection of data on TAR in 1997. In this study, using data from the SAP, we look at trends in the use and outcomes of TAR in Scotland.

**Methods:** We identified 499 patients from the SAP who underwent TAR between 1997 and 2015 with imaging available on the National Picture Archiving and Communication System (PACS). We identified, and looked at trends in, implant type over the following time periods: 1998-2005; 2006-2010 and 2011-2015. Age, gender, indication and outcomes for each time period were examined and also trends with implant type over time.

**Results:** There were 499 primary TAR procedures with an overall incidence of 0.5/105 population per year. Eight different implants were identified with significant changes in the numbers of each type used over time. The peak incidence of TAR was in the 6th decade. The mean age of patients undergoing TAR from 59 years in 1997-2005, to 65 years in 2011-15 ( $p < 0.0001$ ). The percentage of patients with inflammatory arthropathy was 52% in 1997-2005, compared with 10% in 2011-2015. Subsequent arthrodesis and infection rates appeared to be higher during the first time period. The female to male ratio also changed over time. The incidence of TAR increased overall during the study period ( $r = 0.9$ ,  $p < 0.0001$ ). This may be due to a broadening range of indications and patient selection criteria, in turn due to increased surgeon experience and the evolution of implant design.

**Conclusion:** This study examines a large number of TARs from an established arthroplasty registry. The rate of TAR has increased significantly in Scotland from 1997 to 2015. Indication and patient age has changed over time and this could potentially impact outcomes after ankle replacement.

### FP17

#### Early outcomes of revision total ankle arthroplasty using the INBONE II and INVISION systems

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Revision options for a failed Total ankle arthroplasty (TAA) have historically been limited to complex hindfoot fusions, bespoke ankle arthroplasty revision or amputation. The patient outcomes of these procedures has been felt to be poor. The introduction of the INBONE-II and INVISION ankle arthroplasty revision systems has created a range of revision arthroplasty options, with the possibility of improved patient outcomes. We aim to report on the early results of 20 sequential revision TAA.

All patients undergoing revision TAA with INBONE-II or INVISION had prospective collection of pre-operative and post-operative MOx-FQ and EQ-5D scores. Between September 2013 and June 2019 23 patients underwent revision TAA with mean time from implantation of 35 months (6 to 74). Those with greater than 1 year follow-up had scores included. Other outcomes included radiographic assessment for loosening and revision.

13 patients had INBONE-II and 10 INVISION. None required revision at the time of review. Pre-operative MOx-FQ averaged 40.6 (13.4 pain, 21 walking, 6.2 social). Post-operative MOx-FQ averaged 17.4 (6.2 pain, 8.1 walking, 3.1 social). Average EQ-5D improved from 8 to 6.6 and average EQ-VAS from 60 to 80. On radiograph review one patient had radiolucent lines around their INBONE-II stem evident at 1 year. This had not progressed by 4 years total follow-up. Another patient had uncoupling of part of the stem of her INBONE-II but had not required revision. This was attributed to surgeon error.

Revision TAA using the INBONE-II and INVISION systems shows promising early results relating to loosening and revision and good maintained improvement in MOx-FQ and EQ-5D scores. This provides further evidence that patients with a failed TAA can safely have revision rather than having to commit to complex ankle/hindfoot fusion. This provides surgeons with flexibility particularly in those patients with other hindfoot arthritis or arthrodesis.

### FP18

#### The role of rotation in total ankle replacement

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**Background:** The importance of total ankle replacement (TAR) implant orientation in the axial plane is poorly understood with major variation in surgical technique of implants on the market. Our aims were to better understand the axial rotational profile of patients undergoing TAR.

**Methods:** In 157 standardised CT Scans of end-stage ankle arthritis patients planning to undergo primary TAR surgery, we measured the relationship between the knee posterior condylar axis, the tibial tuberosity, the transmalleolar axis (TMA) and the tibiotalar angle. The foot position was measured in relation to the TMA with the foot plantigrade. The variation between medial gutter line and the line bisecting both gutters was assessed.

**Results:** The mean external tibial torsion was  $34.5 \pm 10.3^\circ$  ( $11.8-62^\circ$ ). When plantigrade the mean foot position relative to the TMA was  $21 \pm 10.6^\circ$  ( $0.7-38.4^\circ$ ) internally rotated. As external tibial torsion increased, the foot position became more internally rotated relative to the TMA (pearson correlation 0.6;  $p < 0.0001$ ). As the tibiotalar angle became more valgus, the foot became more externally rotated relative to the TMA (pearson correlation -0.4;  $p < 0.01$ ). The mean difference between the medial gutter line and a line bisecting both gutters was  $4.9 \pm 2.8^\circ$  ( $1.7^\circ-9.4^\circ$ ). More than 51% of patients had a difference greater than  $5^\circ$ . The mean angle between the medial gutter line and a line perpendicular to the TMA was  $7.5 \pm 2.6^\circ$  ( $2.8^\circ-13.7^\circ$ ).

**Conclusion:** There is a large variation in rotational profile of patients undergoing TAR, particularly between the medial gutter line and the transmalleolar axis. Surgeon designers and implant manufacturers need to develop consistent methods to guide surgeons towards judging appropriate axial rotation of their implant on an individual basis. We recommend careful clinical assessment and CT scans pre-operatively to enable the correct rotation to be determined.

## FP19

### The HIntegra Total Ankle Replacement: survivorship, failure modes and patient reported outcomes in 70 consecutive cases with a minimum 5 year follow up

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**Introduction:** We report the functional outcome and survivorship of the HIntegra Total Ankle Replacement (TAR), in consecutive cases by multiple surgeons in a single UK institution. Between 2010-2014 the HIntegra TAR held 7.1% UK market share and surgeons should be aware of failure mechanisms.

**Methods:** We conducted a retrospective review of prospectively collected data for 70 consecutive HIntegra TAR cases in a single institution between 2010-2014. Data collected included patient demographics, complications, reoperations, patient reported outcome measures (PROMS: AOS, MOX-FQ, pain VAS) and patient satisfaction.

**Results:** The 70 patients (54 male/ 16 female) had an average age of 69 (range 48-84 years). Mean follow up was 76 months (range 60-104), 10 patients died during the follow up. Implant survivorship was 81.4% at most recent follow up. The commonest radiographic finding was periprosthetic cysts (n=28, 40%), size range (7-40mm), location of cysts: isolated talus (n=14), isolated tibia (n=6), mixed (n=8). 10 failed TARs were revised to Inbone TAR at a mean of 48 months (range 9-69). 3 Failed TARs were revised to arthrodesis (2 tibiotalar fusions, 1 hindfoot nail). 11 patients required reoperation with implant retention: 8 periprosthetic cyst debridement and grafting at a mean of 61 months (range 27-91), 1 lateral gutter debridement and 1 periprosthetic fracture ORIF. PROMS data was available for all patients. Overall patients showed marked improvement in functional outcome scores between pre-operative and final follow up questionnaires. Mean pre-op AOS: 62, MOX-FQ: 68 and pain VAS: 67.5 with mean final follow up scores of: AOS: 35, MOX-FQ: 36 and pain VAS: 30.

**Conclusion:** Our experience demonstrates improved PROMS following ankle arthroplasty for patients with a mean follow up of 6.4 years. Implant survivorship is similar to other TAR studies. We have identified a high incidence of periprosthetic cysts and would recommend ongoing surveillance of these patients.

## FP20

### Pes cavovarus in Charcot-Marie-Tooth compared to the idiopathic cavovarus foot: a preliminary weightbearing CT analysis

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**Introduction:** Pes cavovarus is a foot deformity that can be idiopathic (I-PC) or acquired secondary to other pathology. Charcot-Marie-Tooth disease (CMT) is the most common adult cause for acquired pes cavovarus deformity (CMT-PC). The foot morphology of these distinct patient groups has not been previously investigated. The aim of this study was to assess if morphological differences exist between CMT-PC, I-PC and normal feet (controls) using weightbearing computed tomography (WBCT).

**Methods:** A retrospective analysis of WBCT scans performed between May 2013 and June 2017 was undertaken. WBCT scans from 17 CMT-PC, 17 I-PC and 17 healthy normally-aligned control feet (age-, side-, sex- and body mass index-matched) identified from a prospectively collected database, were analysed. Eight 2-dimensional (2D) and three 3-dimensional (3D) measurements were undertaken for each foot and mean values in the three groups were compared using one-way ANOVA with the Bonferroni correction.

**Results:** Significant differences were observed between CMT-PC or I-PC and controls ( $p < 0.05$ ). Two-dimensional measurements were similar in CMT-PC and I-PC, except for forefoot arch angle ( $p = 0.04$ ). 3D measurements (foot and ankle offset, calcaneal offset and hindfoot alignment angle) demonstrated that CMT-PC exhibited more severe hindfoot varus malalignment than I-PC ( $p = 0.03, 0.04$  and  $0.02$  respectively).

**Discussion:** CMT-related cavovarus and idiopathic cavovarus feet are morphologically different from healthy feet, and CMT feet exhibit increased forefoot supination and hindfoot malalignment compared to idiopathic forms. The use of novel three-dimensional analysis may help highlight subtle structural differences in patients with similar foot morphology but aetiologically different pathology.

## FP21

### Risk of saphenous nerve injury during syndesmotic stabilisation with the TightRope technique

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**Background:** The use of a knotless TightRope for the stabilisation of a syndesmotic injury is a well-recognised mode of fixation. It has been described that the device can be inserted using a "closed" technique. This presents a risk of saphenous nerve entrapment and post-operative pain.

**Aim:** We aimed to establish the actual risk of injury to the Saphenous Nerve using a "closed" technique for the insertion of a TightRope.

**Method:** 20 TightRopes were inserted into Fresh Frozen Cadavers. This was done using the senior authors preferred technique of divergent tightropes with the distal implant directed slightly anterior to the fibula-tibia axis and the proximal implant slightly posterior in order to simulate the greatest risk to the nerve. This was done under image Intensifier guidance to simulate an intraoperative environment. The medial side of the distal tibia was then dissected to directly record and measure the relationship of the TightRope to the Saphenous Nerve. Measurements were taken using digital calipers from the centre of the button on the medial side of the TightRope to the centre of the nerve at the point of closest proximity.

**Results:** 12 TightRopes were found to exit posterior to the nerve, 7 anterior and 1 penetrated through the centre of the nerve. The mean distance from the centre of the button to the nerve was 6.99mm (range 0.72-14.52mm, standard deviation 4.33mm). In 9 of the 20 TightRopes, the nerve was found to be less than 5mm away.

**Conclusion:** Our findings demonstrated that the risks of damaging or indeed entrapping the Saphenous nerve were high, and therefore we would advocate an open incision on the medial side with judicious exploration to ensure there is no damage to the medial neurological structures.

## FP22

### Day Case Total Ankle Replacement

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**Introduction:** Day Case Surgery (defined as same day discharge) is a priority within the National Health Service and has been shown to provide beneficial outcomes for patients and hospitals. We report our experience developing a Day Case Programme for Total Ankle Replacement (TAR).

**Methods:** Prior to the introduction of a Day Case Programme, average length of stay following TAR in our unit was 3.5 days. Stakeholders were consulted about ways in which same day discharge could be facilitated. Patients' post-operative pain charts were reviewed prior to the introduction of this programme. Inclusion criteria included non-complex surgery (anticipated tourniquet < 2hrs), friend or relative support and pre-operative walking-aid assessment. An enhanced recovery protocol included long-acting popliteal block and dexamethasone. Patients were discharged with opiate analgesia and written pain instructions. Patients were asked to complete a pain and satisfaction questionnaire. Patient Reported Outcome Measures (PROMs) were recorded.

**Results:** From September 2017 to April 2019 21 of 70 patients underwent TAR as a Day Case. Mean age was 67 years (43-85 years). Complications included two delayed wound healings and one representation on day three with urinary retention. No patients reported post-operative nausea or vomiting, 60% did not use Oramorph at home. Average Visual Analogue Score for pain was 23/100 on day one and 21/100 day three post-operatively. There was no significant difference in pre-operative or overall change in MOXFQ, VAS or EQ5D PROMS.

**Conclusions:** Early results suggest that Day Case Total Ankle Replacements are safe. Appropriate patient selection is necessary. Day Case Surgery relies on support and communication between multiple teams to organise and run effectively.

FP23

**The deep deltoid ligament and stability after ankle fracture: a cadaveric study**

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**Background:** Supination-external rotation (SER) injuries make up 80% of all ankle fractures. SER stage 2 injuries (AITFL and Weber B) are considered stable. SER stage 3 injury includes disruption of the posterior malleolus (or PITFL). In SER stage 4 there is either medial malleolus fracture or deltoid injury too. SER 4 injuries have been considered unstable, requiring surgery. The deltoid ligament is a key component of ankle stability, but clinical tests to assess deltoid injury have low specificity. This study specifically investigates the role of the components of the deep deltoid ligament in SER ankle fractures.

**Aim:** To investigate the effect of deep deltoid ligament injury on SER ankle fracture stability.

**Methods:** Four matched pairs (8 specimens) were tested using a standardised protocol. Specimens were sequentially tested for stability when axially loaded with a custom rig with up to 750N. Specimens were tested with: ankle intact; lateral injury (AITFL and Weber B); additional posterior injury (PITFL); additional anterior deep deltoid; additional posterior deep deltoid; lateral side ORIF. Clinical photographs and radiographs were recorded. In addition, dynamic stress radiographs were performed after sectioning the deep deltoid and then after fracture fixation to assess tilt of the talus in eversion.

**Results:** All specimens with an intact posterior deep deltoid ligament were stable when loaded and showed no talar tilt on dynamic assessment. Once the posterior deep deltoid ligament was sectioned there was instability in all specimens. Surgical stabilisation of the lateral side prevented talar shift but not talar tilt.

**Conclusion:** If the posterior deep deltoid ligament is intact SER fractures may be managed without surgery in a plantigrade cast. Without immobilisation the talus may tilt, risking deltoid incompetence.



# POSTERS

## ABSTRACT SUMMARY

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**Comparative study assessing sporting ability after arthrodesis and cartiva hemiarthroplasty for treatment of hallux rigidus**

B. Brandao<sup>1</sup>, A. Aljawadi<sup>2</sup>, A. Fox<sup>2</sup>, A. Pillai<sup>2</sup>

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P2

**Severe insertional Achilles tendinopathy: Our experience with two different surgical techniques**

K. Ahmad<sup>1</sup>, R. Maheshwari<sup>1</sup>, A. Munoruth<sup>1</sup>, R. Kucharski<sup>1</sup>, Z. Abiddin<sup>1</sup>

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P3

**Surgical reconstruction in patients with a delayed presentation of TURF toe injury: early functional outcomes**

M. Salim<sup>1</sup>, R. Limaye<sup>1</sup>, M. Alsayed<sup>1</sup>, P. Karpe<sup>1</sup>, A. Chauhan<sup>1</sup>

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**Does the presence of pes planus deformity increase recurrence of hallux valgus deformity following surgery?**

L. Weigelt<sup>1</sup>, G. Heyes<sup>1</sup>, A. Vosoughi<sup>2</sup>, L. Mason<sup>1</sup>, A. Molloy<sup>1</sup>

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P5

**The posterior malleolus approaches clock: a method of guiding incision choice for fragment specific fixation**

S. Gandham<sup>1</sup>, G. Millward<sup>1</sup>, A. Molloy<sup>1</sup>, L. Mason<sup>1,2</sup>

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**The spring ligament meniscus: an anatomical study**

M.L.T. Jayatilaka<sup>1</sup>, A. Bond<sup>2</sup>, A. Fisher<sup>2</sup>, M. Philpott<sup>1</sup>, L.-A. Amber<sup>1</sup>, L. Fisher<sup>2</sup>, A. Molloy<sup>1,2</sup>, L. Mason<sup>1,2</sup>

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**High BMI increases rates of non-union in hind and mid-foot arthrodesis**

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**Surgery for non-union after 5th metatarsal fractures - the good guy becomes the bad guy!**

M. Sheridan<sup>1,2</sup>, E. Kokkinakis<sup>1</sup>, N.J. Madeley<sup>1</sup>, C. Senthil Kumar<sup>1</sup>

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**Nottingham experience with the fixed bearing Infinity Total Ankle Replacement**

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H. Majeed<sup>1</sup>, J. Davenport<sup>2</sup>, M. Karski<sup>2</sup>, R. Smith<sup>2</sup>, T. Clough<sup>2</sup>

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M. Kakwani<sup>1</sup>, J. Coorsh<sup>1</sup>, D. Townshend<sup>1</sup>, R. Kakwani<sup>1</sup>, A. Murty<sup>1</sup>

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K. Siwicki<sup>1</sup>, A. Walls<sup>1</sup>, K. James<sup>1</sup>

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P. D'sa<sup>1</sup>, S. Vaidhyathanaswamy<sup>1</sup>, J. Manara<sup>1</sup>, K. Hariharan<sup>1</sup>

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L. Weigelt<sup>1</sup>, G. Heyes<sup>1</sup>, E. Swanton<sup>2</sup>, L. Mason<sup>2</sup>, A. Molloy<sup>2</sup>

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**Subtalar arthroereisis as an adjunct for treatment of the flexible adult acquired flatfoot deformity - a 9 years experience**

J. Dhaliwal<sup>1</sup>, T. Goff<sup>2</sup>, D. Carmody<sup>3</sup>, A. Wines<sup>2</sup>

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<sup>2</sup>Royal North Shore Hospital, Sydney, Australia,

<sup>3</sup>Mater Institute, Sydney, Australia

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T. Howard<sup>1</sup>, J. Giddie<sup>2</sup>, I. Riechert<sup>1</sup>, R. Ahluwalia<sup>2</sup>

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B. Drake<sup>1</sup>, W. Reeve<sup>2</sup>, P. Dearden<sup>2</sup>, R. Kakwani<sup>1</sup>, A. Murty<sup>1</sup>, N. Talbot<sup>2</sup>, A. Hughes<sup>2</sup>, D. Townshend<sup>1</sup>,

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R. Jogia<sup>1</sup>, D.E. Modha<sup>2</sup>, M.-F. Kong<sup>3</sup>, R. Berrington<sup>1</sup>

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**Comparison of topical skin adhesive and simple interrupted nylon sutures for wound closure in forefoot surgery: a prospective randomised trial**

T. Goff<sup>1,2</sup>, R. Varrall<sup>1</sup>, P. Robinson<sup>1</sup>, K. Fogarty<sup>1</sup>, R. Ray<sup>1</sup>, A. Chang<sup>1</sup>, J. Dhaliwal<sup>1</sup>, P. Dearden<sup>1</sup>, A. Wines<sup>1</sup>

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**Comparative analysis of dorsal nerve relocation versus dorsal neurectomy in the surgical management of Morton's neuroma**

M. Koti<sup>1</sup>, M. Edwards<sup>1</sup>, M. Parikh<sup>1</sup>, J. McAllister<sup>2</sup>, S.A. Hasan<sup>1</sup>

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**High Incidence of spring ligament failure in ankle fractures with complete deltoid ruptures: a previously missed entity leading rapid destabilisation of the first ray and symptomatic adult flat foot**

A.M.E.-S. Ali<sup>1</sup>, B. Kiliyanpilakkil<sup>1</sup>, C. Pasapula<sup>1</sup>

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**Role of subtalar arthroereisis as adjunct procedure in treating stage IIb adult-acquired flatfoot deformity**

A. Bernasconi<sup>1</sup>, M. Argyropoulos<sup>1</sup>, S. Patel<sup>1</sup>, Y. Ghani<sup>1</sup>, N. Phyo<sup>1</sup>, N. Cullen<sup>1</sup>, D. Singh<sup>1</sup>, M. Welck<sup>1</sup>

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**Charcot foot reconstruction - how does hardware failure and non-union affect the clinical outcomes?**

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**The anatomy and insertion of the anterior inferior tibiofibular ligament and the wagstaffe fracture**

M. Philpott<sup>1</sup>, A. Fisher<sup>2</sup>, L. Jayatilaka<sup>1</sup>, L.-A. Lambert<sup>1</sup>, L. Fisher<sup>2</sup>, A. Bond<sup>2</sup>, A. Molloy<sup>1</sup>, L. Mason<sup>1</sup>

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P25

**Revision of failed primary total ankle replacements to the Inbone 2 Total Ankle Replacement system: the Nottingham Experience**

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**POSTERS**  
**ABSTRACT DETAILED**



## P1

### Comparative study assessing sporting ability after arthrodesis and cartiva hemiarthroplasty for treatment of hallux rigidus

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**Background:** Arthrodesis and Cartiva synthetic cartilage implant (SCI) are accepted treatments for hallux rigidus. Arthrodesis is the gold standard treatment of hallux rigidus. Although good functional outcomes have been reported for both procedures, there is little data available on post-operative sporting ability for these patients. As of now, there are no independent comparative series for treatment of hallux rigidus utilising polyvinyl alcohol implants.

**Objectives:** To compare sporting ability after Arthrodesis and Cartiva SCI hemiarthroplasty of the first metatarsophalangeal joint.

Study design and methods: Patients at a single centre with symptomatic hallux rigidus who underwent Arthrodesis or Cartiva SCI hemiarthroplasty were identified. Sporting ability was assessed at a minimum of 12 months post-operative utilising the patient reported outcome measure, Foot & Ankle Ability Measure (FAAM) sports questionnaire. First metatarsophalangeal joint arthritis was radiographically graded according to the Hattrup and Johnson (HJ) classification.

**Results:** 42 Arthrodesis and 26 Cartiva patients were included in this study. Mean ages for this cohort were 64 and 58 respectively with a follow-up time of 19 and 18 months respectively. Arthrodesis patients consisted of 6.8% HJ1, 40.9% HJ2 and 52.3% HJ3 and Cartiva SCI patients 31% HJ2 and 69% HJ3 with no HJ1 patients.

Mean post-operative FAAM scores were 80.9% for Arthrodesis and 78.9% for Cartiva SCI. Mann-Whitney U testing revealed no statistically significant difference between Arthrodesis and Cartiva SCI (p>0.3).

Comparing age (< 55 and >55) and gender matched cohorts revealed no statistically significant results.

**Conclusions:** Our results suggest that both Arthrodesis and Cartiva SCI result in similar post-operative sporting ability. Cartiva SCI results in a faster return to activities and preserves joint flexibility with adequate pain reduction. More research with larger cohorts and longer follow up is indicated. Initial results of Cartiva SCI are favourable and comparable to arthrodesis.

## P2

### Severe insertional Achilles tendinopathy: Our experience with two different surgical techniques

K. Ahmad<sup>1</sup>, R. Maheshwari<sup>1</sup>, A. Munoruth<sup>1</sup>, R. Kucharski<sup>1</sup>, Z. Abiddin<sup>1</sup>

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**Introduction:** Severe insertional Achilles tendinopathy (IAT) is difficult to treat. This study reviews our experience of two surgical approaches undertaken at a single unit, open debridement of Achilles tendon insertion and dorsal closing wedge calcaneal osteotomy.

**Methods:** 35 patients with failed conservative management were considered for surgery. 25 patients were in the open debridement and 11 patients in the calcaneal osteotomy group. The open debridement, with excision of Haglund's when present, was performed by a single surgeon from 2010-2019. Standard technique used, with suture anchors for reinforcement of TA when required. The calcaneal osteotomies were performed by another surgeon during 2014-2019. Zadek's technique was utilized and plantar cortex was kept intact at the apex of the osteotomy. Fixation was achieved with screws, IOFIX device or calcaneal compression plates. The Manchester-Oxford foot questionnaire (MOXFQ) and followup assessment by the surgeon were used to assess outcomes.

**Results:** A total of 36 feet (35 patients) were assessed with a mean age of 52.6 years and followup of 20 weeks. The debridement group showed 76% (19 patients) with good to excellent outcome. Three patients required revision debridement with a fair outcome. Three patients had a poor outcome. One patient required revision with Zadek's osteotomy, two patients were referred to rheumatology for ongoing pain.

The calcaneal osteotomy group showed 82% (9 patients) with good to excellent outcome. Two patients required removal of metal work with a fair outcome. One patient developed plantar fasciitis. Osteotomies were united in all patients. There were no major complications including venous thromboembolism in either group.

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**Conclusions:** Both techniques are safe and satisfactory and correct patient selection is paramount for each. Calcaneal osteotomy also demonstrates encouraging results. The authors recommend a prospective comparative study with larger population and longer followup, as there is paucity of such studies in published literature.

## P3

### Surgical reconstruction in patients with a delayed presentation of TURF toe injury: early functional outcomes

M. Salim<sup>1</sup>, R. Limaye<sup>1</sup>, M. Alsayed<sup>1</sup>, P. Karpe<sup>1</sup>, A. Chauhan<sup>1</sup>

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**Introduction:** TURF toe is a hyperextension injury of the first metatarsophalangeal joint common amongst athletes. Axial loading of the dorsiflexed MTP joint in a well grounded forefoot results in the attenuation or disruption of the capsular ligamentous complex supporting the joint. This may lead to an unstable joint, fracture of the sesamoids or traumatic valgus deformity of the toe.

**Aim:** The aim of this study is to assess outcomes and complications following surgical treatment for delayed TURF toe presentation using the Manchester-Oxford foot questionnaire.

**Materials and methods:** Prospective data was collected for 7 patients who received surgery for delayed TURF toe presentation. All patients underwent a standardized process of care and all cases were operated on by a single foot and ankle surgeon. Functional outcome scores were measured using the MOXFQ and statistics were obtained using SPSS for Windows. Data was checked for normality, which confirmed a non-normal distribution. Subsequently, the non-parametric Wilcoxon signed rank test for paired data was used to test for statistical significance between the pre and post-operative scores.

**Results:** This study included 3 male and 4 female patients who had surgery between 2011 and 2015. Patients presented 12 to 18 months following initial injury. The mean age at the time of surgery was 32.7 years and mean follow up was 7.5 months post operative. 5 of the 7 patients had a history of hyperextension injury of the great toe. Improvements in all domains were statistically significant (P=< 0.05). The mean time to return to full functional capacity post-operative was 4 months, and no complications or reoccurrence of symptoms were documented following surgery.

**Conclusion:** This study demonstrated that good patient outcomes can be obtained with appropriate surgical treatment of TURF toe injuries with delayed presentation following a correct diagnosis and careful selection of surgical candidates.

## P4

### Does the presence of pes planus deformity increase recurrence of hallux valgus deformity following surgery?

L. Weigelt<sup>1</sup>, G. Heyes<sup>1</sup>, A. Vosoughi<sup>2</sup>, L. Mason<sup>1</sup>, A. Molloy<sup>1</sup>

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Risk factors for Hallux Valgus include; shod footwear, genetic factors, metatarsal morphology, ligamentous laxity and Pes Planus. Loss of arch increases Hallux plantar medial pressures and drives deformity during heel rise. Elevation of Hallux with defunctioning of Peroneus Longus, hindfoot eversion and forefoot abduction also contribute.

There is little in the literature regarding whether Pes Planus is associated with increased recurrence rates. This paper reports a retrospective review of 183 consecutive Hallux valgus cases performed 07/03/2008-05/12/2017. Follow up for at least six months . X-rays were performed at six weeks, three months and at six and/or 12 months . We examined Sesamoid location (Hardy and Clapham Classification), Hallux Valgus Angle (HVA), Intermetatarsal Angle, Meary's angle and Talonavicular uncovering.

12 were excluded due to previously amputated second toes, Hallux Varus, revision surgery and loss to follow up. Or the 171 remaining cases 75 had Pes Planus (Meary's < -4o).

144/171 (84.2%) cases had HVA correction to < 15o. The incidence of recurrent HVA > 15o was significantly higher in those with Meary's angle < - 4o (Chi-Sq P-value0.000002). Those with a Meary's angle -20o to -10o had a significantly higher rate of recurrence than ones measuring -10o to -4o (Chi-Sq P-value0.0018). 51/75 (68%) breaks in Meary's line were located at the Naviculocuneiform joint.

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Overall progression of deformity was no different between those initially corrected post surgery to HVA < 15o (Chi-Sq P-value 0.61) and those not. Multiple regression analysis revealed there was no meaningful association with sesamoid location and recurrence.

Our results demonstrate a link between Pre-operative Pes Planus deformity and increased recurrence rates of Hallux Valgus deformity following surgery.

## P5

### The posterior malleolus approaches clock: a method of guiding incision choice for fragment specific fixation

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**Aim:** The aim of this study was to determine the most appropriate approach for fixation of each type and fragment of posterior malleolar fractures.

**Materials and methods:** A retrospective analysis of a prospectively collected database was performed on 141 posterior malleolar fractures. On the CT scan axial slice, a clock face was drawn using the posterolateral corner of the tibia as the centre and the Achilles tendon as the 6 o'clock axis. A box was then drawn from the fracture plane, with 90-degree lines corresponding to the medial line (ML) and lateral line (LL) extremity of the fracture and a central line (CL) (i.e. orthogonal central plane, for optimum screw placement). It was recorded where the ML, LL and CL exited the clock face. All fracture patterns were further assessed by both senior authors regarding their choice of approach based on CL and all variances resolved by discussion.

**Results:** The LL was equivalent across the groups (except for the 2B medial fragments), indicating a consistent posterolateral corner fragment throughout the posterior malleolar sub types (p=.25). The medial aspect (ML) of the type 1, type 2A and posterolateral fragments of type 2B were equivalent. The posterolateral approach was determined to be the most appropriate approach to access these posterolateral fragments. The ML of type 3 fractures was significantly more medial than the other type 1 and 2A (p< .05), and almost all could be appropriately accessed through the posteromedial approach. The majority of type 2B fractures (2/3rds) were determined to be best accessed through a combined posterolateral and medial posteromedial approaches.

**Conclusion:** We conclude that the extent of each subtype of posterior malleolar fractures are anatomical consistent. To fully expose each fracture, differing incisions are necessary and can be accurately predicted by CT classification and the clock face method.

## P6

### The spring ligament meniscus: an anatomical study

M.L.T. Jayatilaka<sup>1</sup>, A. Bond<sup>2</sup>, A. Fisher<sup>2</sup>, M. Philpott<sup>1</sup>, L.-A. Amber<sup>1</sup>, L. Fisher<sup>2</sup>, A. Molloy<sup>1,2</sup>, L. Mason<sup>1,2</sup>

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**Introduction:** An articular facet composed of fibrocartilage has previously been described in the superomedial spring ligament. Our aim in this study was to analyse this fibrocartilage structure, assessing its association with the other aspects of the acetabular pedis.

**Methods:** We examined 14 cadaveric lower limbs that had been preserved for dissection at the Human Anatomy and Resource Centre at Liverpool University in a solution of formaldehyde. The spring ligament was approached from the superior direction. The talus was disarticulated and high-resolution images were taken of the acetabular pedis. ImageJ software was used to calculate the surface area of the spring ligament articular facet (SLAF).

**Results:** Dissection was performed on 14 specimens, 4 left and 10 right. All specimens were morphologically normal with no evidence of previous surgical intervention. The mean area of the SLAF was 140.79mm<sup>2</sup> (95% Confidence intervals 125.31, 156.27), equivalent to the size of the medial facet of the calcaneum. The SLAF was attached anteriorly

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to the navicular and posteriorly to the sustentaculum, orientated to not only bear weight in stance phase with the load of the talar head but also in propulsive phase, bearing weight between the navicular and the sustentaculum tali when the foot was in inversion. The SLAF was composed of fibrocartilage with a smooth superior articular surface.

**Conclusion:** The SLAF is an important weight bearing structure in all phases of gait. More work needs to be done in its role in the biomechanics of the foot and the options for reconstruction in pes planus deformity.

## P7

### High BMI increases rates of non-union in hind and mid-foot arthrodesis

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**Background:** Arthrodesis is used to treat arthritis and deformity in a range of hind and midfoot joints. The affect of BMI on rates of non-union remains unclear from current evidence. We have analysed our cohort of patients to further examine this relationship.

**Methods:** 381 primary joint arthrodeses (in 277 patients) were identified from a single surgeon's logbook. Case notes were reviewed to gather demographic data including BMI. Patients were divided into obese (BMI >30) and normal (BMI < 30). Primary outcome was clinical union as diagnosed by the treating physician at the time, based on clinical and radiological review.

**Results:** 190 joints were classed as obese and 191 as normal. There were no significant differences in baseline demographics or rates of smoking. There was a significantly higher rate of non-union amongst the obese group (7.9%) than the normal group (2.6%), P-Value 0.030. There was no difference in rates of deep infection or delayed union.

**Conclusion:** Previous literature has not been conclusive on the impact of BMI on non-union rates. Data from our cohort supports a role of obesity in the development of non-union. The majority of patients are advised to remain non-weightbearing in cast immobilisation post-operatively. It is not clear if our findings are as a result of a physiological or biomechanical cause.

## P8

### Surgery for non-union after 5th metatarsal fractures - the good guy becomes the bad guy!

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**Introduction:** The majority of the 5th metatarsal fractures are successfully treated conservatively and only a few patients require surgical fixation for symptomatic non-union. The tuberosity avulsion fractures are generally considered benign injuries with the more distal fractures showing a propensity to develop delayed/non-union. We studied a cohort of patients who underwent surgery for the treatment of non-union and report on the outcome and the rate of complications and requirement for additional surgery.

**Methods:** All patients, who required surgery to their fifth metatarsal, from June 2008 to May 2018, were included in this retrospective study. Demographic and clinical outcome data and radiographic classification of fracture types were collected, reviewed and analysed.

**Results:** 35 patients had undergone surgery for 5th metatarsal fractures during this time period and 31 of these had been operated for a painful non-union. 12 were tuberosity avulsion fractures (Lawrence and Botte Type 1) and 23 were Type 2 and 3. Five patients (14.3%) experienced a further symptomatic non-union after initial surgery; Type 1 fractures were 11 times more likely to result in non-union (p=0.0375). Wound complications were seen in 14.3% of the sample whilst 22.9% of the group required some form of further surgery, with a significant association between Type 1 fractures and the need for further surgery (p=0.0107).

**Conclusion:** This study is the first of its kind reporting specifically on the outcome after surgical fixation of a non-union of the fifth metatarsal fractures. Overall, surgery had a good outcome with a low complication rate, though it is interesting to note that Type 1 fractures which traditionally have a low non-union rate after conservative treatment are associated with a significantly increased incidence of non-union if operated for symptomatic non-union and require additional surgery.

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## P9

### Nottingham experience with the fixed bearing Infinity Total Ankle Replacement

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**Introduction:** Total ankle arthroplasty (TAA) is increasingly used for treatment of end stage arthritis of the ankle; improvements continue to evolve in implant design and instrumentation. Recently there has been considerable excitement about fixed bearing TAA and we present our experience of the Infinity Total Ankle Arthroplasty, this is a fixed bearing 4th generation implant with improved instrumentation.

**Methods:** This is a retrospective study with prospective data collection, we identified in our institution 92 (52 Male/40 Female) who had the an infinity Total ankle replacement during the period October 2016 -July 2019, The mean age 67.5(33-87), there were 43 right side and 49 left none of our patients had bilateral ankle replacements, the indication for the surgery was End stage Osteoarthritis in 83 patients and Rheumatoid arthritis in 9, All patients had follow up appointments at 6 weeks, 3,6 and 12 months and were required to fill in PROMS (MOXFQ and EQ5D) all had weight bearing X-rays as well.

**Results:** Improvement in Clinical outcome and PROM data was noted on follow up, radiological alignment was maintained, it was noted that 15(16%) patients had heterotopic ossification in the posterior capsule, lucency in the tibia implant was noted in 4 ankles and fibula erosion was noted in one, 2 implanted needed to be revised due to malpositioning and we had no infections in our short term series.

**Conclusion:** Our results show considerable improving in patient outcomes, particular short recovery time and improvement in mobility post operatively, and low complication rate, only 2 implants were revised and we attribute that the learning curve needed at the start of practice.

This implant is fluoroscopically navigated allowing precise implantation with dedicated instrumentation and we feel this attributed to the low complication rate and good results in our short-term study.

## P10

### Long-term outcome of ankle replacements in patients with inflammatory joint disease and osteoarthritis: Is there a difference?

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**Aims:** We aim to provide long-term implant survival rates of total ankle replacement in patients with inflammatory joint disease and osteoarthritis.

**Methods:** Between November 1993 and February 2000, a single surgeon implanted 200 Scandinavian Total Ankle Replacement (STAR) prostheses (184 patients). Data were collected prospectively. Pain and function were assessed using American Orthopaedic Foot and Ankle Society (AOFAS) hindfoot scoring system. Failure was considered as re-operation with revision of one or all the components or conversion to arthrodesis.

**Results:** The underlying diagnosis was inflammatory joint disease in 119 and primary or posttraumatic osteoarthritis (OA) in 81 ankles. Mean age at implantation was 60 years with a significant difference in the two groups (IJD=58.2 years, OA= 62.6 years, p= 0.01). Mean follow-up was 15.8 years. Mean AOFAS scores were comparable in the two groups (IJD=61, OA=60). Nineteen patients were lost to follow up.

In total 32 ankles required revision (16%); 14 in IJD (11.7%) and 18 in OA group (22.2%), significantly lower in IJD group (p=0.03). Average time from surgery to implant failure was 9.5 years in patients with IJD and 7.1 years in patients with OA. One hundred patients (113 ankles) died during the observation period, of which 87 patients (100 ankles) died without requiring revision surgery. Among the surviving 84 patients (87 ankles, IJD=40, OA=47), seven ankles in patients with IJD and twelve ankles in patients with OA required revision surgery. At 15.8 years, the overall implant survival was 76.16%. The implant survival was 81.95% in patients with IJD and 68.10% in patients with OA (p=0.03).

**Conclusion:** We report significantly better long-term implant survival rates in patients with inflammatory joint disease compared to OA after total ankle replacement with similar functional results. The predominant mode of failure was coronal plane malalignment in IJD and aseptic loosening in OA.

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## P11

### Outcomes of spiral osteotomy of the tibia to correct coronal plane deformities in patients with concomitant end-stage osteoarthritis of the ankle

M. Kakwani<sup>1</sup>, J. Coorsh<sup>1</sup>, D. Townshend<sup>1</sup>, R. Kakwani<sup>1</sup>, A. Murty<sup>1</sup>

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**Introduction:** The management of end-stage osteoarthritis of the ankle with concomitant angular deformity of the tibia more than 10 degrees generally necessitates the correction of the deformity prior to operative intervention for the ankle. We present a series of patients with the CORA of tibial deformity at the middle third / lower third junction of the tibia corrected with spiral osteotomy of the tibia. Osteotomies of the tibia around diaphysis have a higher risk of complications including non-union.

**Methodology:** All patients who underwent the tibial spiral osteotomy and plate fixation under the care of senior authors at our institute between 2008 to 2019 were included in our present study. The patient demographics and details of the operation, degree of correction achieved, complications and any further interventions for the ankle arthritis were noted as well.

**Results:** A total of 12 patients (M:F = 7:5; average age = 68.8 years) were identified that underwent a spiral tibial osteotomy. Prior to the osteotomy, the average distance from the ankle to the CORA was 10.24 cm and the average degree of coronal plane deformity was 11.24. 10 patients had a varus deformity and 2 patients had a valgus deformity. 4/12 patients went on to have an ankle replacement after the osteotomy, 8/12 had their symptoms well controlled with the osteotomy itself and did not need ankle surgery. None of the patients had non-union or metal-ware failure. 4 patients needed removal of metal-ware.

**Conclusion:** As a summary, the procedure of spiral oblique tibial osteotomies is a safe and re-producible method to align the tibia prior to definitive interventions for the ankle. 66% of patients had their ankle arthritis symptoms significantly improved by the correction of their limb alignment.

## P12

### The evaluation of outcomes for neglected or relapsed club-foot managed with circular frame in a low-income country

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**Background:** Worldwide the majority of club-feet are treated conservatively with the Ponseti method. However, in countries where resources and medical expertise are limited, neglected club-foot is commonly encountered and is often too late to respond to conservative treatment.

**Objectives:** To analyse the outcomes of patients treated with circular frame correction for neglected, resistant or relapsed congenital clubfoot (CTEV).

**Methods:** Between 2008 and 2016 twenty-seven patients with neglected or relapsed clubfoot have been treated with circular frame at Beit-CURE Hospital in Malawi. Ten patients were excluded from the study for valid reasons, leaving 19 patients with a total of 29 Ilizarov corrections. Evaluation of clinical outcomes included four scoring systems with objective and subjective components.

**Results:** Follow-up ranged from one to nine years. At review all patients reported an improvement in the shape and function of their feet. One patient had no deformity according to PAVER-score, sixteen mild, twelve moderate and none had severe deformity. According to ICSFG assessment, very good and good results were obtained in 12 feet, 16 fair and 1 scored poor. Ponseti functional rating showed similar results with ten feet classified as excellent and good, seventeen as fair and one had poor result.

Subjective outcomes measured with OxAFQ-C showed, with minor exceptions, patients' overall satisfaction with the improvement of their feet function and appearance. Two patients reported less than good or very good physical results, all reported no or nearly no limitations at school, and only three reported less than 100% emotional satisfaction with their outcomes.

**Conclusions:** This case series of 29 relapsed or neglected clubfoot deformities managed by ilizarov correction, is the biggest of its kind found in the literature for a low-income country. The short term clinical and functional results of resistant clubfoot deformities with Ilizarov's external fixator is promising and apparently a good option.

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## P13

### The ability to wear high heeled footwear after first metatarsophalangeal joint fusion

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**Background:** Fusion is a well entrenched treatment modality for symptomatic 1stMTP joint arthritis. It has been customary to advice female patients that they would be unable to wear high-heeled footwear post surgery due to lack of dorsiflexion at the 1stMTPJ.

**Objectives:** To determine the proportion of patients who could continue wearing high-heels after 1stMTPJ fusion and whether they required a change in the size of their footwear.

**Methods:** A retrospective review of 50 female patients who have had an isolated 1stMTPJ fusion between 2004 and 2016 was undertaken with a follow-up telephone survey which included questions on ability to wear high-heels pre and post-operatively, duration and height of heels they could wear.

**Results:** This study included 50 female patients (62 feet) with mean age of 63(43-78) years with a mean follow up of 6.5(2.5-14) years from surgery. Of 42 patients who wore high-heels pre-surgery, 26(62%) continued wearing them. Majority of them (n=23) were able to wear the same height heels.

88% patients were able to wear heel heights of 1.5" or higher and wear them for 30 minutes to 8hours (Mean=3hrs 15mins). 20 patients (40%) required different sized footwear following surgery. None of the patients wearing high-heels returned to clinic with midfoot/hindfoot symptoms, one returned for IPJ symptoms.

**Conclusions:** This pilot study has important implications for information given to patients during consent for this operation. It may be that in many cases functional change in neighbouring joints compensates for the loss of movement at the 1stMTPJ although it was outside the scope of this study to determine how this occurred.

Our results have shown that many patients continue to wear high-heels following 1st MTPJ fusion with minimal symptoms in neighbouring joints. The most important factor appears to be the ability of the patient to wear high-heels preoperatively.

## P14

### Early outcomes of pes planus reconstruction using either hamstring allograft or synthetic ligament

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The medial longitudinal arch is crucial to efficient gait and the Spring and Naviculocuneiform ligaments are important stabilisers. Attenuation of these ligaments leads to Pes Planus deformity and subsequent defunctioning of the PTT. This prospective study evaluates the functional and radiological outcomes of Spring and Naviculocuneiform ligament reconstruction using Hamstring (Semitendinosis) allograft vs. Synthetic ligament (Internal BraceTM, Arthrex). 33 reconstructions were performed 11/11/2013-06/03/2018. All patients underwent serial radiographs and functional scores including; MOXFQ, EQF5D and VAS, within minimum six month follow up.

Surgery included a proximal medial gastrocnemius recession and medialising calcaneal osteotomy where required. For allograft reconstructions, a pre-tensioned Semitendinosis allograft was fixed proximally to Talar neck using a tenodesis screw and passed plantar to PTT and through a bone tunnel in the medial cuneiform. Synthetic ligaments were inserted from the Sustentaculum Tali to the medial cuneiform in a hammock fashion. In both reconstructions tendinopathic PTTs were excised and FDL transferred. 17 were synthetic ligament reconstructions (6 male/11 female) and 16 allograft reconstructions (6 male/10 female). Groups were matched pre-operatively for age, functional scores and radiological markers (T-test P-values >0.05). At six months significantly better improvements were observed in the synthetic ligament group compared to allograft group with regards to VAS, MOXFQ pain score, Meary's line, 1st metatarsal Talus angle, Talonavicular uncoverage angle and Hindfoot alignment (T-test P< 0.05). Statistical significance was maintained at 12 months with the synthetic ligament providing a significantly better reduction of Meary's line 1st Metatarsal Talar angle, Talonavicular uncoverage and hindfoot alignment. 2 patients were revised to double fusions in the allograft group and 1 patient revised in the synthetic ligament group. Statistically significant improved functional scores and radiological appearance can be found up to 1 year following Synthetic ligament reconstruction of the Spring and Naviculocuneiform

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ligaments when compared to Hamstring allograft.

## P15

### Subtalar arthroereisis as an adjunct for treatment of the flexible adult acquired flatfoot deformity - a 9 years experience

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<sup>2</sup>Royal North Shore Hospital, Sydney, Australia,

<sup>3</sup>Mater Institute, Sydney, Australia

**Background:** The purpose of this study is to evaluate the use of subtalar arthroereisis as an adjunct in the surgical management of the flexible adult acquired flatfoot deformity.

**Methods:** Two hundred and twenty-nine feet in 214 adult patients with Stage IIA acquired flatfoot deformity had reconstructive surgery including a medialising calcaneal osteotomy, flexor digitorum longus tendon transfer, and implantation of a subtalar arthroereisis device, during the study period (2010-2018). Clinical assessment was performed with FAOS scores. Post-operative questionnaire including patient satisfaction, how likely to have same surgery again were completed. Impact of implant removal was considered.

**Results:** 150 women and 64 men were included, mean age 57 years (24-82). Mean follow up was 2.4 years (6 months - 5.1 years). Subtalar arthroereisis implant was removed in 108 feet (47%) for lateral hind foot pain at an average of 8.5 months (6-26 months) following the primary procedure, with symptom resolution in all but 4 cases later necessitating subtalar arthrodesis. No significant difference in post-operative FAOS scores was observed between patients with retained implant versus implant removed (p= 0.6). Patients who had Achilles lengthening performed had lower rate of implant removal but difference was not statistically significant. Post-operatively 95% of patients were either satisfied or very satisfied with the results of their surgery.

**Conclusions:** Reconstruction of the flexible adult acquired flat foot with an adjunctive subtalar arthroereisis resulted in satisfactory reproducible clinical outcomes in the medium term. Implant removal is considered by the authors for persistently symptomatic patients but does not appear to adversely impact outcome.

## P16

### Early experience of autologous graft, hydroxyapatite & calcium sulphate antibiotic paste in revision hind-foot & ankle arthrodesis

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Revision arthrodesis on a background of infection carries high risks. We describe a new technique combining adjuvant antibiotic loaded bio-composite autologous bone graft layer technique coupled with rigid fixation in definitive surgical reconstruction.

Patients who underwent revision foot and ankle arthrodesis for proven/suspected infection were included. Standard work-up including local aspiration, bone-biopsy, definitive radiology and MDT-discussion. Definitive arthrodesis involved debridement of infected scar tissues, multiple biopsies as either part of a staged or definitive process. All bone voids were measured intra operatively and classified according to volume.

At definitive arthrodesis pelvic autograft (cancellous/ cortical/structural) was mixed/layered with a 40% hydroxyapatite (HA), 60% calcium sulphate (CaS) paste with appropriate antibiotic to fill the void; followed by compression fusion.

Empirical/pathogen specific antibiotics were given until sample-specific-antibiotics were identified. All patients were followed up for a minimum 1 year & AOFAS scoring undertaken.

20 pts meet the inclusion criteria, and were prospectively followed up, M:F ratio (n = 1:1), mean age 52.7yrs, 25% were smokers. Surgical indications following deep sampling for revision arthrodesis:

Infected non/mal-union (n=14)

Aseptic-loosening (n=6)

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Voids defects at the time of surgery were:

< 1cm<sup>3</sup> (n=2)

1 - 1.5 cm<sup>3</sup> (n=8)

1.5 - 2cm<sup>3</sup>, (n=8)

2 - 5cm<sup>3</sup> (n=2)

12 pts were treated with Vancomycin 8 with Gentamicin paste depending on bacterial advice and pre-operative sampling. No-patients were lost to follow-up; 87.5% were united on imaging and mean time to independent-ambulation was 2.9 months (functional weight bearing was reached at 1.1 months). Two-patients had radiographic evidence of non-union 1-asymptomatic, & 1-requiring revision surgery (void >3cm). Two-patients remain under review. The average AOFAS score was 82.8; no-patients were treated for post-operative-infection.

Layered-autologous bone-grafting, with adjuvant-antibiotic loaded bio-composite and rigid fixation has been shown to be effective and safe in revision arthrodesis with low co-morbidities in void gaps are less than-2cm<sup>3</sup>.

## P17

### Minimum two year outcomes of a fixed bearing total ankle replacement in the United Kingdom

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<sup>2</sup>The Royal Devon and Exeter Hospital NHS Foundation Trust, Exeter, United Kingdom

**Introduction:** The Infinity (Wright Medical Group) total ankle replacement (TAR) has become the most implanted ankle replacement in the United Kingdom (UK) with a 30.1% share in the most recent 2016 England and Wales National Joint Registry 14th report. It is a fixed bearing implant utilising an anterior approach and radiological guidance to aid alignment, and is approved for use in the UK as an uncemented implant.

**Methods:** Since introducing the Infinity TAR in June 2014, all implants from two centres in the UK; The Royal Devon and Exeter Hospital National Health Service (NHS) Foundation Trust and Northumbria NHS Healthcare Trust, have been followed up prospectively. 113 implants are included with two year minimum follow-up, average follow-up being 33 months (24-52). Pre- and post-operative demographic, radiographic and functional outcomes were collected including Visual Analogue Score (VAS), Manchester Oxford Foot Questionnaire (MOxFAQ; UK validated patient reported outcome score) and EQ5D (validated quality of life score). Complexity was assessed using the Canadian Orthopaedic Foot and Ankle Society classification pre-operative grade.

**Results:** Implant survivorship was 93.8% at two years minimum. Median age was 68 years (42-92), male:female ratio 72:41. Mean MOxFAQ improved by 28, mean EQ5D by 1.4 and mean VAS by 7. 16 cases had planned additional procedures, five required intra-operative medial malleolar fixation. There have been two revisions for deep infection, two for tibial sided implant subsidence, one for instability and two for unexplained pain (6.2%). Five patients have required further surgery to the ankle and hindfoot with implant retention (4.4%). Three patients have asymptomatic tibial cysts (3.4%) and one patient has an asymptomatic talar cyst (0.9%), there is no evidence of progression or loosening.

**Conclusions:** We report favourable early functional, radiographic and survivorship outcomes of this implant in the UK population.

## P18

### Management of osteomyelitis of the diabetic foot using highly purified calcium sulphate impregnated with antibiotics: a 2 year follow up

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**Aim:** Osteomyelitis is a challenging complication of the diabetic foot with prevalence of up to 20% of infected ulcers. This may lead to a greater incidence of amputations. Whilst 70-80% of osteomyelitis can be managed with systemic antibiotics alone surgery is indicated for those in whom this fails. Traditionally, surgery involves debriding to healthy

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bone, leaving the wound open for drainage. This often leaves severe tissue loss. There are many local antibiotic delivery products used in adjunction to surgery.

The aim our study was to look at outcomes over a 2 years follow up of 109 diabetic patients who underwent surgery using highly purified calcium sulphate/ antibiotics as an adjunct.

**Method:** 109 patients were reviewed who had undergone day case surgery from March 2013 to February 2016. Conservative management with off-loading and systemic antibiotics were tried. All patients had neuropathy and their circulation deemed to be adequate. Osteomyelitis was diagnosed using imaging and/or microbiology. All patients underwent debridement of the ulcer and bone sequestra. Remaining bone was packed with highly purified calcium sulphate impregnated with Vancomycin 1g and Gentamicin 80mg. Intra operative bone samples were sent to microbiology. Primary closure was carried out where possible.

**Results:** Median duration of ulcer pre-operatively 17 weeks

Duration of pre-operative systemic antibiotics 8 weeks

Healing time post operatively 6 weeks

Duration of antibiotics post operatively 1.4 weeks

No complications / adverse events noted.

**Discussion:** Results show effectiveness of this treatment modality for management of osteomyelitis. The authors acknowledge limitations of this case series and would recommend a prospective multi-centre randomised control trial.

**Conclusion:** Our experience using this technique has changed the way we manage our patients. We offer this much earlier in the patient's management particularly where the wound is deteriorating despite being on appropriate antibiotics. We have reduced the duration of systemic antibiotics.

## P19

### Comparison of topical skin adhesive and simple interrupted nylon sutures for wound closure in forefoot surgery: a prospective randomised trial

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There are many options for wound closure in forefoot surgery. The purpose of this study was to compare topical skin adhesive (2-Octyl-cyanoacrylate) to simple interrupted nylon sutures with attention to the quality of wound healing and acceptability to the patient.

Patients undergoing 1st ray forefoot surgery utilising a medial incision, Hallux Valgus correction or 1st MTPJ arthrodesis, were recruited. Patients were randomised during surgery to final layer wound closure with either the intervention topical skin adhesive (TSA) or the control interrupted nylon sutures (INS). Primary outcome measured was wound care pain (VAS) at 2 weeks post operatively. Secondary outcomes assessed include time taken to perform wound closure, quality of wound healing and time taken for wound care at 2 weeks postoperatively, and patient satisfaction at 6 weeks postoperative.

70 patients (18 bilateral) were recruited, 42 feet in each study group (after 4 exclusions for incomplete data). Mean age 61 (29-83). There were no statistical differences in the demographics or surgery performed between groups. Patient reported pain was significantly less with TSA (VAS 0 vs 2, p=0.025). Time to perform wound closure was significantly slower for TSA (272secs (SD 72.2) vs 229secs (SD 58.8), p=0.0038), whilst postoperative wound care was significantly faster for TSA (71secs (SD 50.8) vs 120secs (SD 47.8), p< 0.0001). More inflammation and wound edge separation was recorded with TSA (17 vs 5 cases, p=0.006) and (12 vs 3 cases, p=0.02) respectively. A high degree of overall patient satisfaction was reported in both groups, without significant difference.

Topical skin adhesive and interrupted nylon sutures are both acceptable closure methods for forefoot surgery with high satisfaction rates, low pain scores and low complications. However, the observation of significantly more inflammation and areas of wound separation with topical skin adhesive is sufficient to recommend continued routine use of sutures.

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## P20

### Comparative analysis of dorsal nerve relocation versus dorsal neurectomy in the surgical management of Morton's neuroma

M. Koti<sup>1</sup>, M. Edwards<sup>1</sup>, M. Parikh<sup>1</sup>, J. McAllister<sup>2</sup>, S.A. Hasan<sup>1</sup>

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**Methods:** Patients who underwent surgery for Morton's neuroma via the dorsal approach between 2002 and 2014 were analysed. Data was collected using hospital computer database, an in-depth review of patient's case notes, postal and telephonic questionnaires. Out of 76 patients in total, there were 40 in the Dorsal nerve relocation (DNR) and 36 in the Dorsal neurectomy (DN) groups. Primary outcome measures used were Coughlin's overall patient's satisfaction criteria. Secondary outcome measures were resolution of sensory symptoms and any footwear restrictions.

**Results:** This study shows excellent to fair results in 35 patients (87%) in the DNR and 30 patients (83%) in the DN groups. There were poor results in 5 patients (13%) the DNR group and 6 patients (17%) in the DN group. 31 patients (77%) had resolution of sensory symptoms in the toes in the DNR group where as it was in 23 patients (64%) in the DN group. 4 patients (10%) reported no change and 5 (13%) were worse after surgery in the DNR group were as in the DN group 7 patients (19%) reported no change and 6 patients (17%) were worse after surgery. 35 patients (88%) had no restriction in wearing any type of footwear in the DNR group when compared to 30 patients (83%) in the DN group. 5 patients (12%) in the DNR group and 6 patients (17%) in the DN group wore modified or shoes without heels.

**Conclusion:** Overall there was no significant statistical difference in the outcome of the two surgical procedures.

## P21

### High Incidence of spring ligament failure in ankle fractures with complete deltoid ruptures: a previously missed entity leading rapid destabilisation of the first ray and symptomatic adult flat foot

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Injury to the deltoid ligament complex is an easy to diagnose and an accepted frequent consequence following ankle fractures involving the medial foot. Injury to the spring ligament however is not easily diagnosed and the incidence following ankle fractures with deltoid ligament rupture is unknown. We present a series of 15 patients who were followed up at 28.5 (+/-14) months post ankle fracture involving deltoid ligament rupture as diagnosed on radiographs. We found that 100% of patients had spring ligament rupture as diagnosed with a lateral translation score of >20mm (p< 0.001). These patients were also found to have tarsometatarsal (TMT) instability, an established complication of spring ligament rupture, implicated in the development of adult acquired pes planus (p< 0.001). We found that the degree of spring ligament strain correlated with the degree of TMT instability (correlation coefficient +0.62). This study demonstrates an unrecognised phenomenon in the literature. The rupture of the spring ligament at the time of injury is not recognised and, as we demonstrate with TMT instability, leads to rapid failure of the first ray. This finding would indicate that a new facet of treatment must be recognised and implemented in the long term management of ankle fractures as this medial column instability must be recognised.

## P22

### Role of subtalar arthroereisis as adjunct procedure in treating stage IIb adult-acquired flatfoot deformity

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**Background:** The role of subtalar arthroereisis (STA) in surgical management of adult acquired flexible flatfoot deformity (AAFD) is controversial. Our aim was to determine whether STA as adjunct procedure improved radiographic correction of stage IIb AAFD focusing on the longitudinal medial arch and forefoot abduction. We also reported complications after STA.

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**Methods:** All patients diagnosed with stage IIb AAFD treated by medialising calcaneal osteotomy, flexor digitorum longus transfer, spring ligament repair with or without Cotton osteotomy and STA between 2004 and 2019 were retrospectively reviewed. Seven measurements were recorded on pre and minimum 24-week postoperative weightbearing radiographs by two observers. Interobserver reliability was assessed. Univariate analysis was used to test the association of demographic (sex, side, age, BMI) and surgical variables (Cotton osteotomy and STA) with change in radiographic angles. Significant variables were included in a multivariable regression model. Twentytwo feet (21 patients, mean±SD age: 55.2±2.4 years) with a mean±SD radiographic follow-up of 11.2±1.2 months were investigated.

**Results:** There was excellent interobserver reliability for all parameters (ICC range, 0.75-0.94).

The addition of STA correlated with greater change in the talonavicular coverage angle (TNCA) (p=0.04) and calcaneus-fifth metatarsal angle (CFMA) (p=0.01), while Cotton osteotomy did not (p>0.05). Multivariate regression showed that STA was the only predictor of change in TFNA (p=0.03) and in CFMA (p=0.02). The final regression model demonstrated that STA was associated to a greater change in TNCA by 10.1 degrees and in CFMA by 5 degrees. Four (33%) patients complained of sinus tarsi pain, requiring removal of the implant with resolution of symptoms in three quarters of cases.

**Conclusion:** Subtalar arthroereisis as an adjunct procedure to medialising calcaneal osteotomy, flexor digitorum longus transfer, spring ligament repair in the treatment of stage IIb AAFD leads to improved forefoot abduction, measured through TNCA and CFMA.

## P23

### Charcot foot reconstruction - how does hardware failure and non-union affect the clinical outcomes?

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**Aim:** Surgical reconstruction of severe Charcot foot deformities using internal fixation is a commonly used option. However, there has been a concern that this carries a higher risk of major hardware failure. The aim of our study was to look at the demographics of hardware failure and non-union in Charcot midfoot and hindfoot reconstructions, the radiological and clinical outcomes in those with and without hardware failure.

**Results:** 19/78 (24.4%) patients had major hardware failure. 14/25 (56.0%) of patients who underwent combination hindfoot and midfoot surgery had hardware failure, in comparison to 5/53 (9.4%) in cases with surgery in either hindfoot or midfoot (p < .001). 7/19 (36.8%) patients developed full fusion radiologically, compared to 49/59 (83.1%) of the non-hardware failure patients (p < .001). In the hardware failure group 9/19 (47.4%) were able to weight bear in shoes, in comparison to 43/59 (72.9%) in the non-hardware failure patients (p=.040). 10/19 (52.6%) patients from the hardware failure group needed a cast or orthosis to ambulate compared to 11/59 (18.6%) in the non-hardware failure group (p=.004). 8/19 (42.2%) in hardware failure cases required revision surgery, compared to 19/59 (32.2%) in the non-hardware failure cases (p= .089) The patients with BMI over 30 were 3.5 times more likely to have hardware failure (95% CI [1.08, 12.22], p = .038). Limb salvage was achieved in all patients.

**Conclusion:** The hardware breakage is common following Charcot hindfoot and midfoot deformity corrections, highest among combined reconstructions. However, the clinical and radiological outcomes are still satisfactory following such complex procedures. Dedicated durable hardware designed for Charcot foot reconstructions will potentially reduce this complication and improve the patient outcomes further.

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P24

**The anatomy and insertion of the anterior inferior tibiofibular ligament and the wagstaffe fracture**

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**Introduction:** Our aim in this study was to identify the fibular footprint of the Anterior Inferior Tibiofibular Ligament (AITFL) and its relation to Wagstaffe fracture fragment size.

**Methods:** We examined 25 cadaveric lower limbs that had been preserved in a solution of formaldehyde. The lower limbs were carefully dissected to identify the ligamentous structures on the anterolateral aspect of the ankle. The AITFL anatomy was compared to Wagstaffe fractures identified from our ankle fracture database. All ankles which had undergone CT imaging were included in the study.

**Results:** There were 13 right and 12 left feet used for dissection. The AITFL origin was from the anterior fibular tubercle with an average length of 21.49 mm (95% CI 20.14, 22.85). The average distance of the distal aspect of the AITFL footprint to the distal fibula margin was 11.60mm (95% CI 10.49, 12.71).

40 ankle fractures with Wagstaffe fracture fragments were identified from our database. The average age of the patients was 52.2 years. On average the length of the Wagstaffe fragment was 10.28mm (95% CI 8.12, 12.44). The average distance from the distal tip of the fibula to the Wagstaffe fracture fragment was 9.58mm (95% CI 20.14, 22.85)

In total there were 22 syndesmosis injuries, The average length of the Wagstaffe fragment associated with syndesmotic instability on testing was 11.25 (95% CI 7.66, 14.84). The average Wagstaffe fracture length in syndesmotic stable ankle fractures was 9.21 (95% CI 6.81, 11.61). The difference was not statistically significant p=0.462 (Mann-Whitney test).

**Conclusion:** The AITFL fibular origin was almost twice the length of the Wagstaffe fracture fragments seen in our institution. Therefore, this suggests that a ligamentous failure.

P25

**Revision of failed primary total ankle replacements to the Inbone 2 Total Ankle Replacement system: the Nottingham Experience**

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Number of primary total ankle replacement (TAR) rises, the need for revision TAR's has also increased. Salvage procedures for failed TAR to date have ranged from ankle and TTC fusions, cement arthroplasty, attempts at further ankle replacement and below knee amputations. Clearly revision to another TAR is ideal and thus attempts continue to develop a satisfactory revision implant system.

We present our experience of the Inbone 2 TAR system for revision of failed TAR from a high volume total ankle arthroplasty centre in the UK. We believe this to be the largest series of the Inbone 2 implant as a revision system worldwide, presented to-date.

**Methods:** We carried out a retrospective review of prospectively collected data at our institution and identified 26 patients (17M, 9F) that required revision to the Inbone 2 TAR with a mean age 66 years (51-81) between June 2016 and July 2019, the mean time to revision was 60 months (15-150) All implants were revised because of aseptic loosening. All patients were required to fill in PROMS (MOXFQ, EQ5D) and all had weight bearing X-rays at their follow up appointments at 6 weeks, 3, 6 and 12 months and then annually.

**Results:** A substantial improvement was noted in the clinical presentation of these revision cases as borne out by the significant improvement of their PROM scores, radiological alignment and range of movement. No lysis, cyst formation or ectopic bone was noted on x-rays at this early stage. All patients were fully mobile without walking aids. Full data will be presented at the meeting if the paper is selected.

**Discussion:** This very short-term review has got us excited because of the improvements noted clinically and radiologically. Whilst the procedure is complex, it does offer an opportunity to retain movement. Clearly these difficult cases will need continued follow-up.

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