

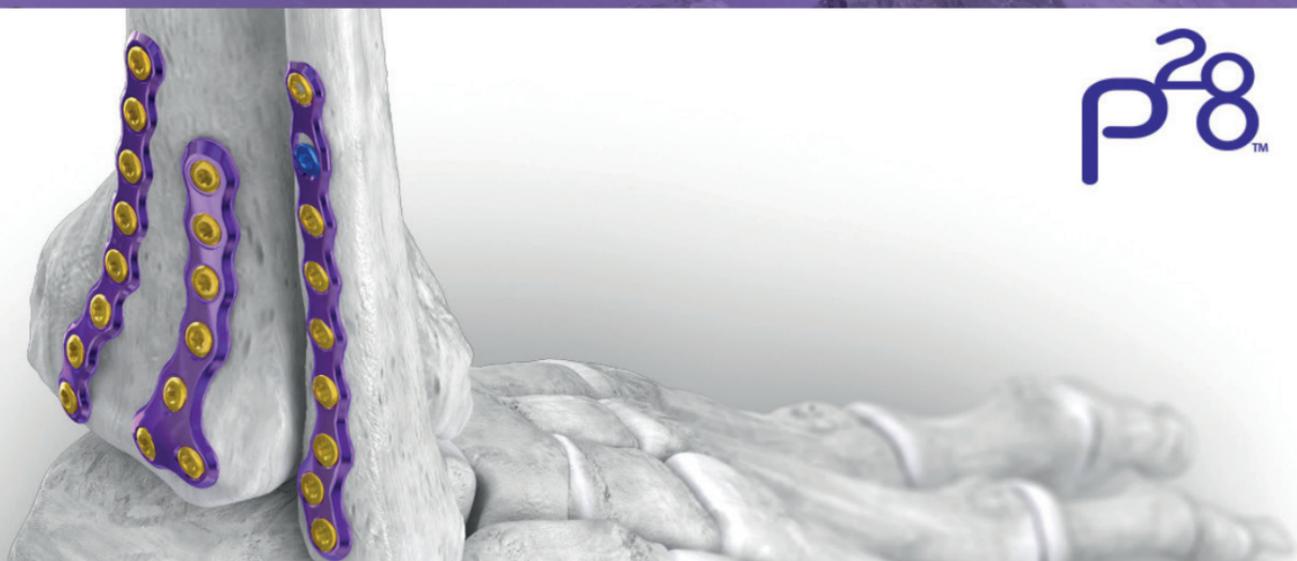
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**FREE PAPERS**  
ABSTRACT SUMMARY

# FREE PAPERS 1

Wednesday 29th January 2025 12.20 - 13.05

## FP1

### Long term consequences of Total Ankle Replacement versus Ankle Fusion; a 25 year national population study of 41,000 patients

Mr Conor Hennessy<sup>1</sup>, Mr Simon Abram<sup>1</sup>, Mr Con Loizou<sup>2</sup>, Mr Rick Brown<sup>2</sup>, Mr Bob Sharp<sup>2</sup>, Mr Adrian Kendal<sup>1</sup>

<sup>1</sup>NDORMS, University of Oxford,  
<sup>2</sup>NOC, OUH, Oxford

## FP2

### Supramalleolar Osteotomy for ankle arthritis; single Tertiary Referral Centre - 12 year overview comparing standard and custom Implant

Seyed Ashgar Ali, Mr Islam Mubark<sup>1</sup>, Mr Konara Weerasinghe<sup>1</sup>

<sup>1</sup>University Hospital Birmingham NHS Trust

## FP3

### Custom 3D-Printed Implants for Critical-Sized Bone Defects in Foot and Ankle Surgery: A Multicentre Collaborative Study

Professor Jitendra Mangwani<sup>1</sup>, Mr Abbas See<sup>2</sup>, Dr Linzy Houchen-woloff<sup>1</sup>,  
3D custom made multicentre collaborative

<sup>1</sup>University Hospitals of Leicester,  
<sup>2</sup>University of Nottingham,  
<sup>3</sup>University of Leicester

## FP4

### Does return to physical activity differ between Ankle Arthrodesis versus Total ankle replacement - 1 Year follow up study

Mr Faizan Jabbar<sup>1</sup>, Miss Andrea Nicolas<sup>1</sup>, Mr Simon Chambers<sup>1</sup>, Mr Paulo Torres<sup>1</sup>, Mr Sultan Qasim<sup>1</sup>, Professor Malik Siddique<sup>2</sup>, Dr Jayasree Ramaskandhan<sup>2</sup>

<sup>1</sup>Freeman Hospital, The Newcastle upon Tyne Hospitals NHS Foundation Trust,  
<sup>2</sup>Freeman Hospital, The Newcastle upon Tyne NHS Foundation Trust

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## FP5

### Clinical comparison of fixed bearing versus mobile bearing total ankle replacement

Mr Samer Bitar<sup>1</sup>, Mr James Davenport, Mr Michael Karski<sup>1</sup>, Mr Joseph Ring<sup>1</sup>, Mr Robert Smith<sup>1</sup>, Mr Timothy Clough<sup>1</sup>

<sup>1</sup>Wrightington Hospital

## FP6

### Single Stage Revision Total Ankle Replacement, Is it Safe?

Mr Parikshit Pekhale<sup>1</sup>, Mr Martin Raglan<sup>1</sup>, Mr Sunil Dhar<sup>1</sup>

<sup>1</sup>Nottingham University Hospitals

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## FREE PAPERS 2

Thursday 30th January 2025 15.45 - 17.00

### FP7

#### A 10-year follow up of Arthroereisis screws in Adult Flat Foot Reconstruction

Mr Jagmeet Bhamra<sup>1</sup>, Mr Adam Fell<sup>2</sup>, Mr Mohamed Hashem<sup>2</sup>, Mr Callum Clark

<sup>1</sup>University Hospital Lewisham,

<sup>2</sup>Wexham Park Hospital

### FP8

#### Osteochondral lesions of the talus: Comparison of outcomes between Osteochondral autologous transplantation and matrix associated stem cell transplantation as primary and revision procedures

Dr Angela Faustino<sup>1</sup>, Mrs Evelyn Murphy<sup>1</sup>, Mr Geoffrey Crozier Shaw<sup>1</sup>, Dr. Robert Murphy<sup>2</sup>, Prof. Stephen Kearns<sup>1</sup>

<sup>1</sup>Department of Trauma and Orthopaedics, Galway University Hospital, Galway, Ireland,

<sup>2</sup>Galway University Hospital, Galway, Ireland

### FP9

#### A National survey of BOFAS members on the treatment of primary osteochondral defects of the talus

Mr Murtaza Khan<sup>1</sup>, Mr Thomas Ankers<sup>1</sup>, Mr Jitendra Mangwani<sup>2</sup>, Mr Nilesh Makwana<sup>1</sup>

<sup>1</sup>Robert Jones Agnes Hunt Orthopaedic Hospital,

<sup>2</sup>University Hospitals Leicester

### FP10

#### The Classification, Pathoanatomy and Radiological Outcomes of Medial Wall Blowout Fractures of the Ankle

Mr Junaid Aamir<sup>1</sup>, Dr Rahul Mohan Kumar<sup>2</sup>, Mr Mustafa Ali<sup>3</sup>, Mr Bin Sahl Abdullah<sup>3</sup>, Mr James McEvoy<sup>2</sup>, Dr Craig Wyatt<sup>2</sup>, Prof Anand Pillai<sup>3</sup>, Prof Lyndon Mason<sup>2</sup>

<sup>1</sup>Liverpool University Hospital NHS Foundation Trust,

<sup>2</sup>Liverpool University Hospitals NHS Foundation Trust,

<sup>3</sup>Manchester University NHS Foundation Trust

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### FP11

#### Fifth Metatarsal Fracture Pattern Mapping and Associated Outcomes - An Observational Cohort Study

Mr Abdul-Rahman Gomaa<sup>1</sup>, Mr Jejelola Apata-Omisore<sup>1</sup>, Dr Shahjahan Aslam<sup>1</sup>, Mr Luke Marsh<sup>1</sup>, Mr Arjun Paramasivan<sup>1</sup>, Mr Nicholas Ward<sup>1</sup>, Mr Ahmed Galhoum<sup>1</sup>, Prof Lyndon Mason<sup>1</sup>

<sup>1</sup>University Hospitals of Liverpool NHS Foundation Trust

### FP12

#### Gravitational stress views overestimate ankle instability and may commit patients to unnecessary surgery: a prospective series with 10 year follow up

Mr Nicholas Heinz<sup>1</sup>, Dr Hamzah Hanif<sup>2</sup>, Mrs Kate Bugler<sup>1</sup>, Mr Andrew Duckworth<sup>3</sup>, Mr Timothy White<sup>1</sup>

<sup>1</sup>Royal Infirmary of Edinburgh,

<sup>2</sup>University of Edinburgh,

<sup>3</sup>University of Edinburgh, Royal Infirmary of Edinburgh

### FP13

#### The Impact of Achilles Tendon Rupture on the Structure and Function of the Achilles Tendon and Plantarflexors after Non-Surgical Management: A Cross-Sectional Study

Mr Samuel Briggs-Price<sup>1</sup>, Professor Tom Yates<sup>1</sup>, Mr Jitendra Mangwani<sup>2</sup>, Mr Maneesh Bhatia<sup>2</sup>, Ms Annette Jones<sup>2</sup>, Professor Karin Gravare Silbernagel, Dr Kim Herbert-Losier<sup>4</sup>, Dr Robert-Jan de Vos<sup>5</sup>, Professor Neal L Millar<sup>6</sup>, Professor Bill Vicenzino<sup>7</sup>, Dr Seth O'Neill<sup>1</sup>

<sup>1</sup>University of Leicester,

<sup>2</sup>University Hospitals of Leicester,

<sup>3</sup>University of Delaware,

<sup>4</sup>University of Waikato,

<sup>5</sup>Erasmus MC University Medical Centre, <sup>6</sup>University of Glasgow, <sup>7</sup>The University of Queensland

### FP14

#### Does the measure of Achilles Tendon Resting Angle correlate with outcome after functional bracing and rehabilitation for Achilles rupture? Fourth Generation Percutaneous Transverse Osteotomies for Hallux Valgus: A series of 729 feet

Caroline Plant<sup>1</sup>, Mr John Skidmore<sup>1</sup>, Mr Andrew Pritchard, Mr Vivek Dhukaram<sup>1</sup>

<sup>1</sup>University Hospital Coventry and Warwickshire NHS Trust

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# FREE PAPERS 3

Friday 31st January 2025 09.00 - 10.15

## FP15

### Mortality, re-amputation and post operative complication rates following 28,000 below knee amputation in diabetic patients in England: a national population study 2002-2022.

Mr Conor Hennessy<sup>1</sup>, Mr Simon Abram<sup>1</sup>, Mr Con Loizou<sup>2</sup>, Mr Rick Brown<sup>2</sup>, Mr Bob Sharp<sup>2</sup>, Mr Adrian Kendal<sup>1</sup>

<sup>1</sup>NDORMS, University of Oxford, 2NOC, OUH, Oxford

## FP17

### Diabetic Midfoot Charcot- When to operate, a staged approach to decision making.

Mr Madhu Tiruveedhula<sup>1</sup>

<sup>1</sup>Basildon Hospital, Mid & South Essex NHS Foundation Trust, Basildon, UK

## FP18

### Is the Distal Metatarsal Metaphyseal Angle really just Metatarsal Pronation?

#### A weightbearing CT analysis

Mr Arvind Vijapur<sup>1</sup>, Mr Mohammed Shaath<sup>1</sup>, Mr Shelain Patel<sup>1</sup>, Mr Nick Cullen<sup>1</sup>, Mr Matthew Welck<sup>1</sup>, Mr Karan Malhotra<sup>1</sup>

<sup>1</sup>ROYAL NATIONAL ORTHOPAEDIC HOSPITAL NHS TRUST

## FP19

### Fourth Generation Percutaneous Transverse Osteotomies for Hallux Valgus: A series of 729 feet

Mr Peter Lam<sup>1</sup>, Ms Ayla Newton<sup>2</sup>, Ms Evelyn Murphy<sup>1</sup>, Dr Min Jia Chua<sup>3</sup>, Mr Robbie Ray<sup>4</sup>, Ms Clare Watt<sup>1</sup>, Mr Peter Robinson<sup>5</sup>, Dr Mikai Dalmau-Pastor<sup>6</sup>, Mr Thomas Lewis<sup>2</sup>

<sup>1</sup>Orthopaedic and Arthritis Specialist Centre, Chatswood, Sydney, Australia,

<sup>2</sup>Kings Foot and Ankle Unit, Kings College NHS Foundation Trust,

<sup>3</sup>Department of Orthopaedic Surgery, Tan Tock Seng Hospital, Singapore,

<sup>4</sup>Kings Foot and Ankle Unit, Kings College NHS Foundation Trust, UK,

<sup>5</sup>Avon Orthopaedic Centre, Southmead Hospital, Bristol, UK,

<sup>6</sup>School of Medicine and Health Sciences, University of Barcelona, Barcelona, Spain

## FP20

### Does clinical pronation of the toe correlate with metatarsal rotation? A Retrospective analysis of weightbearing CT images.

Dr Matt Welck<sup>1</sup>, Dr Alexander Beer<sup>1</sup>, Dr Hussain Al-Omar<sup>1</sup>, Dr Ali Najefi<sup>2</sup>, Dr Shelain Patel<sup>1</sup>, Dr Nicholas Cullen<sup>1</sup>, Dr Toguy Koc<sup>3</sup>, Dr Karan Malhotra<sup>1</sup>

<sup>1</sup>Royal National Orthopaedic Hospital NHS Trust,

<sup>2</sup>Northwick Park Hospital NHS Trust,

<sup>3</sup>University Hospital Southampton

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## FP21

### Minimally Invasive Chevron Akin for Hallux Valgus Surgery: A Prospective Observational Study with Mean 6.7 year Follow Up

Mr Oliver Townsend<sup>1</sup>, Niall Hill, Adam Reaney, Mr Togay Koç<sup>1</sup>, Mr Thomas Lewis<sup>3</sup>, Mr David Gordon<sup>4</sup>

<sup>1</sup>University Hospital Southampton,

<sup>2</sup>Cardiff University,

<sup>3</sup>King's College Hospital,

<sup>4</sup>The London Clinic

## FP22

### Revision Of Recurrent Hallux Valgus Deformity Using A Percutaneous Distal Transverse Osteotomy: Surgical Considerations and Mean 3.6 Year Results

Mr Thomas Lorchan<sup>1</sup>, Ms Ayla Newton<sup>2</sup>, Mr Robbie Ray<sup>1</sup>, Mr Min Jia Chua<sup>3</sup>, Ms Evelyn Murphy<sup>4</sup>, Dr Peter Lam<sup>4</sup>

<sup>1</sup>Kings Foot and Ankle Unit, Kings College NHS Foundation Trust,

<sup>2</sup>Kings Foot and Ankle Unit, Kings College NHS Foundation Trust, UK,

<sup>3</sup>Tan Tock Seng Hospital, Singapore,

<sup>4</sup>Orthopaedic and Arthritis Specialist Centre, Chatswood, Sydney, Australia

## FP23

### Neo-Chondrogenesis Using Autologous Matrix Induced Membrane (Amic) In The Treatment Of Freiberg'S Disease Of Lesser Metatarsals Up To 7 Year Folow Up Results

Mr George Koshy<sup>1</sup>, Mr Aysha Rajeev<sup>1</sup>, Mr Kailash Devalia<sup>1</sup>

<sup>1</sup>Queen Elizabeth Hospital, Gateshead

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1. Arthrex, Inc. Data on file (APT-05964). Naples, FL; 2023.

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# BOFAS

## FREE PAPERS ABSTRACT DETAILED

# FREE PAPERS SESSION 1

Wednesday 29th January 2025 12.20 - 13.05

## FP1

### Long term consequences of Total Ankle Replacement versus Ankle Fusion; a 25 year national population study of 41,000 patients

Mr Conor Hennessy<sup>1</sup>, Mr Simon Abram<sup>1</sup>, Mr Con Loizou<sup>2</sup>, Mr Rick Brown<sup>2</sup>, Mr Bob Sharp<sup>2</sup>, Mr Adrian Kendal<sup>1</sup>

<sup>1</sup>NDORMS, University of Oxford,  
<sup>2</sup>NOC, OUH, Oxford

**Introduction:** Definitive treatment for ankle arthritis is either Total Ankle Replacement (TAR) or Ankle Fusion (AF). AF may pre-dispose to hindfoot fusion resulting in a debilitatingly rigid ankle-hindfoot complex. In comparison, TAR may protect against adjacent joint disease but is associated with high revision rates. We do not know the life-time risks of further surgery, adjacent joint disease progression and rare but serious complications of TAR versus AF.

**Methods:** An England population cohort study was performed using the ONS mortality linked Hospital Episode Statistics database (1998-2023). The primary outcome was Kaplan-Meier curve analysis of revision surgery free survival of TAR versus AF. Secondary outcome measures were the rates of any re-operation to the ankle/hindfoot, including hindfoot fusion rate, 90-day complications, and peri-operative mortality.

**Results:** 10,335 TAR and 30,704 AF were analysed. The revision rate of TAR was significantly higher than AF at all time points, including 5 years (6.7% vs 2.1%), 10 years (11.1% vs 2.9%) and 20 years (13.1% vs 3.1%).

There was no significant difference in 20-year risk of hindfoot fusion following AF (5.94%, 95% CI 5.15 to 6.8%) versus TAR (4.80%, 95% CI 3.4% to 6.6%).

TAR was associated with higher risks of intra-operative fracture (0.42% vs 0.10%, RR = 4.35) and re-operation for wound infection (0.26% vs 0.15%, RR 1.74) but fewer pulmonary emboli (0.23% vs 0.58%, RR = 0.40). 28.9% of TAR resulted in a further operation; 60% of which were for exploration/debridement, infection, aspiration and/or revision.

**Conclusions:** Both TAR and AF are safe definitive treatments of ankle arthritis with low peri-operative risk. The risk of subsequent hindfoot fusion after AF is very low and not significantly higher than after TAR. England TAR revision rates are lower than reported globally with many smaller operations performed before the more complex revision surgery

## FP2

### Supramalleolar Osteotomy for ankle arthritis; single Tertiary Referral Centre - 12 year overview comparing standard and custom Implant

Sayed Ashgar Ali, Mr Islam Mubark<sup>1</sup>, Mr Konara Weerasinghe<sup>1</sup>

<sup>1</sup>University Hospital Birmingham NHS Trust

The aim was to demonstrate that Supramalleolar osteotomy is a valuable treatment method in eccentric ankle arthritis in young and middle aged since it is an under-utilised procedure. We retrospectively analysed the outcome of it performed over 12 year period. We also compared the results of recently introduced computer-assisted PSI Integrated custom-made implants with standard implants.

Data was analysed from 48 patients over a period of 12 years of which 40 were by standard implant and 8 by computer assisted custom implant. 31 varus, 18 valgus deformity. The mean age was 57 (26-79 y/o), male:female ratio was 27:19. Mean follow-up was 15.25 months for standard implants; For the computer-assisted procedures the follow up range is 24 to 2 months. TAS, TTS and TT angels were measured pre and post-operatively. Fixation using a plate with/without bone graft or custom-made implant was performed by a single surgeon. MOXFQ and AOFAS questionnaires were completed pre and post-operatively. All followed similar rehabilitation programme.

Average radiological healing time was 24.3 weeks. MOXFQ score improved from 55.17 to 25.11 and AOFAS from 20.16 to 56.21. Complications were 2 non-unions, 1 delayed union, 1 stress fracture. 8 patients require fusion/replacement between 3-5 years.

The PSI Integrated computer-assisted technique gave improved accuracy than standard freehand method with better scores and a smoother approach for the surgeon. Early results with this technique are encouraging as we were able achieve 3 dimensional correction compared to the 2 dimensional correction achieved by the freehand method.

Our results are comparable to similar studies. Being a joint preserving technique, Supra Malleolar Osteotomy should be considered either as an interim or definitive procedure especially with the development of computer assisted technologies which makes the technique easier to reproduce.

## FP3

### Custom 3D-Printed Implants for Critical-Sized Bone Defects in Foot and Ankle Surgery: A Multicentre Collaborative Study

Professor Jitendra Mangwani<sup>1</sup>, Mr Abbas See<sup>2</sup>, Dr Linzy Houchen-wolloff<sup>1</sup>, 3D custom made multicentre collaborative

<sup>1</sup>University Hospitals of Leicester,

<sup>2</sup>University of Nottingham,

<sup>3</sup>University of Leicester

**Introduction:** The treatment of critical-sized bone defects in foot and ankle surgery remains challenging. Traditional methods, such as bone transport, bulk allograft, vascularized bone graft, and Masquelet procedures carry risks including multiple surgeries, donor site morbidity, infection, and non-union. Recently, custom 3D-printed implants have emerged, offering improved anatomical compatibility, eliminating the need for tissue harvesting, and often requiring only a single operation. This study aims to present the largest UK series of custom 3D-printed implants in foot and ankle surgery.

**Methods:** A retrospective multicentre collaborative study was conducted in 10 NHS Trusts. Demographic, surgical and radiographic variables were recorded including: age; sex; side; type of operation; complications; and postop imaging at 6 weeks, 3 months, 6 months and 12 months. Baseline characteristics were described for demographic variables. Categorical variables were expressed as frequencies and percentages.

**Results:** Data was collected on a total of 34 patients. The mean age of patients was 54 years (range 29 to 83). 68% of patients were men. Avascular necrosis was the most common indication for surgery (35%) followed by trauma (21%), total ankle replacement failure (21%), infection (12%), Charcot arthropathy (6%) and AVN and infection (3%). The most common operation performed was a fusion augmented with a truss (44%) and 91% of patients had a combination of regional and general anaesthetic. All patients had an ASA grade of less than 4. Of the patients that had follow-up imaging, the implants were reported intact by 94% at 6 weeks, 78% at 3 months, 68% at 6 months and 67% at 12 months.

**Discussion:** This is the largest case series of custom-made foot and ankle implants in the UK to date. The clinical and radiographic outcomes at one year Follow-up are satisfactory. Further work is required to assess long term implant survivorship.

## FP4

### Does return to physical activity differ between Ankle Arthrodesis versus Total ankle replacement - 1 Year follow up study

Mr Faizan Jabbar<sup>1</sup>, Miss Andrea Nicolas<sup>1</sup>, Mr Simon Chambers<sup>1</sup>, Mr Paulo Torres<sup>1</sup>, Mr Sultan Qasim<sup>1</sup>, Professor Malik Siddique<sup>2</sup>, Dr Jayasree Ramaskandhan<sup>2</sup>

<sup>1</sup>Freeman Hospital, The Newcastle upon Tyne Hospitals NHS Foundation Trust,

<sup>2</sup>Freeman Hospital, The Newcastle upon Tyne NHS Foundation Trust

**Background:** The ability to return to physical activity is an important indicator of surgical success for end-stage ankle arthritis. There is paucity of literature comparing outcomes between surgical procedures. This study aimed to compare outcomes for physical activity and return to function between total ankle replacement (TAR) and ankle arthrodesis (AA) at 1-year follow-up.

**Methods:** This was a single-centre prospective follow-up study. Patients who underwent TAR (n=33) or AA (n=25) between 2022-2023 completed questionnaires on FAOS scores (Pain, Symptoms, ADL and QOL domains), International Physical Activity Questionnaire (IPAQ), satisfaction scores and return to work/driving. IPAQ physical activities were compared across domains of work, transportation, domestic and leisure activities.

**Results:** AA patients were younger (59.1 vs. 65.8). The AA group had better average FAOS scores for pain, symptoms, ADL, and QOL compared to TAR (51.2 vs. 29.2; 40.6 vs. 67.8, 46.8 vs. 66.4, 31.3 vs. 48.3) (p=0.526), but the TAR group reported higher overall satisfaction (77% vs. 66.6%). Earliest return to work was reported at 2 weeks (TAR) vs. 3 weeks (AA) group and driving at 3 weeks (TAR) vs. 4 weeks (AA). More TAR patients returned to vigorous (25%) and moderate (17.6%) physical activity versus AA (0% and 0%). For transport, 4 AA patients vs. 12 TAR patients returned to this activity. AA patients travelled 30 minutes to 2 hours per week, while TAR patients travelled 30 minutes to 5 hours. For household activities, 15.7% of TAR patients reported vigorous activity versus 0% in AA. AA patients spent less time on average leisure walking (1.25 hrs vs. 2 hrs), and more time sitting per day (9.2 hrs vs. 5.9 hrs).

**Conclusion:** The TAR group demonstrated earlier return to work, driving, and higher levels of physical activity compared to AA patients at 1-year follow-up, despite the AA group having better FAOS scores.

## FP5

### Clinical comparison of fixed bearing versus mobile bearing total ankle replacement

Mr Samer Bitar<sup>1</sup>, Mr James Davenport, Mr Michael Karski<sup>1</sup>, Mr Joseph Ring<sup>1</sup>, Mr Robert Smith<sup>1</sup>, Mr Timothy Clough<sup>1</sup>

<sup>1</sup>Wrightington Hospital

**Aims:** We compared the clinical outcomes of a fixed bearing (Infinity) and a mobile bearing (Zenith) ankle replacement in a demographically similar group of patients, from a single, non designer centre.

**Methods:** Between December 2010 and May 2016, 118 consecutive mobile bearing prostheses (Zenith) and between September 2017 and November 2019, 118 consecutive fixed bearing (Infinity) prostheses were implanted in a total cohort of 230 patients. Demographic, clinical, and patient reported outcome measures (PROMs) data were collected. The end point of the study was failure of the implant requiring revision of one or more of the components. Kaplan Meier survival tables were generated.

**Results:** Demographics were similar for both groups (age, pre-operative arthritic diagnosis and co-morbidities). 32 patients (36 ankles) died during follow-up, but none required revision. Of the surviving 198 patients (200 ankles; 93 Zenith, 107 Infinity), mean follow-up was 9.1 years (6.0 - 13.1 years) for Zenith and 5.0 years for Infinity (3.6 - 6.8 years). A total of 11 implants (9.3%) failed for Zenith and 1 implant (0.8%) failed for Infinity, requiring revision. Average time to failure for Zenith was 3.4 years (0.4 - 10.5 years) and the time to failure for Infinity was 4.1 years. Implant survival at five years, using revision as an endpoint, was 91.3% for Zenith and 98.7% for Infinity. There was a mean improvement in Manchester-Oxford Foot and Ankle Questionnaire (MOXFQ) from 85.0 to 32.8 for Zenith and 79.3 to 26.4 for Infinity, and visual analogue scale (VAS) scores from 7.0 to 3.2 for Zenith and 6.9 to 2.7 for Infinity. The commonest reason for revision was aseptic loosening for both implants.

**Conclusion:** Our results show a significantly better survivorship for the fixed bearing over the mobile bearing prosthesis. Whilst the fixed bearing prosthesis had better PROMS scores, this was not significant.

## FP6

### Single Stage Revision Total Ankle Replacement, Is it Safe?

Mr Parikshit Pekhale<sup>1</sup>, Mr Martin Raglan<sup>1</sup>, Mr Sunil Dhar<sup>1</sup>

<sup>1</sup>Nottingham University Hospitals

**Background:** The number of total ankle replacements (TAR) is increasing each year and with that an associated rise in the burden of revision ankle arthroplasty (RAA). The preferred option in our center, following network discussion, is to convert the failing TAR to a RAA. There is uncertainty whether this is best done in a single staged approach or two stages.

The aim of this review was to assess the safety of single to two staged approaches in RAA

**Method:** A review was carried out of the prospectively collected data of all RAA performed in our center between Nov 2016 and Jan 2024. We reviewed; preoperative micro sampling, intraop micro and histology results, infection rate, tourniquet time, length of hospital stay, wound complications and PROMS of all patients who had undergone single staged RAA, compared to two staged.

**Results:** We identified 88 RAA patients, with mean age of 71.4 (38-88) with a minimum of 2 year follow up, range 2 - 6 years. There were 44 Left and 44 Right failing total ankle replacements. 14 were two staged procedures and 74 were single staged. Neither group had any significant intraoperative microbiology growth. There was a significant difference in tourniquet times but with no associated significant complication rate in single stage group. There was one infection in the single staged group that went onto have a successful DAIR. There was no difference in wound complications post op. Both groups showed improvement in PROMS, with no difference between the groups or in increase in length of hospital stay.

**Conclusion:** In our series, which is the largest in the literature, we have found single staged revision arthroplasty to be safe and effective compared to two stage in patients where there is a low index of suspicion of infection.

## FREE PAPERS SESSION 2

Thursday 30th January 2025 15.45 - 17.00

## FP7

### A 10-year follow up of Arthroereisis screws in Adult Flat Foot Reconstruction

Mr Jagmeet Bhamra<sup>1</sup>, Mr Adam Fell<sup>2</sup>, Mr Mohamed Hashem<sup>2</sup>, Mr Callum Clark

<sup>1</sup>University Hospital Lewisham,

<sup>2</sup>Wexham Park Hospital

**Introduction:** The use of an arthroereisis screw is well described in the paediatric population for the correction of flexible flat feet. There are no long-term studies of its use in adults. We performed a functional and radiographic evaluation of a single centre, single surgeon series following the use of a subtalar arthroereisis screw, to augment reconstruction in adult patients with acquired adult flat foot deformity secondary to spring ligament / tibialis posterior tendon failure.

**Methods:** We performed a retrospective review of 40 consecutive feet with stage 2 PTTI that underwent flexor digitorum longus transfer, reefing of the spring ligament, translational medialising calcaneal osteotomy and augmentation with an arthroereisis screw (Kalix, Integra; 22 feet or ProStop, Arthrex; 3 feet), between 2005 and 2021. All arthroereisis screws were electively removed at 6 months. Radiographic values were assessed pre- and post-operatively at 1-year with functional results both at 1-year and average 10-year follow-up.

**Results:** The mean age of patients at surgery was 60 years (range 44-77 years). There was a significant improvement  $p < 0.05$  in radiographic parameters (calcaneal pitch, Mearys angle, medial column height, talus to 1st and 2nd metatarsal angle and talonavicular coverage). There were no re-operations. Manchester Oxford Foot Questionnaire, EQ-5D and VAS scores at an average of 10.6 years for pain were reported as 2.3 (range 0-64, Likert scale), 0.94 (range -0.59-1) and 0.2 (0-10), respectively. Health TODAY averaged at 91.4%.

**Conclusion:** We conclude that the use of an arthroereisis screw is a promising adjunct to conventional reconstruction in adult PTTI that protects the spring ligament repair and tendon transfer during the initial healing time of the soft tissues. Excellent radiological and functional results were obtained in our cohort with high levels of patient satisfaction at long-term follow-up.

## FP8

### Osteochondral lesions of the talus: Comparison of outcomes between Osteochondral autologous transplantation and matrix associated stem cell transplantation as primary and revision procedures

Dr Angela Faustino<sup>1</sup>, Mrs Evelyn Murphy<sup>1</sup>, Mr Geoffrey Crozier Shaw<sup>1</sup>, Dr. Robert Murphy<sup>2</sup>, Prof. Stephen Kearns<sup>1</sup>

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Osteochondral lesions of the talus (OLTs) are common pathologies, associated to chronic pain and disability. Currently, there is no agreed gold standard for surgical treatment of OLTs, due to lack of superiority trials. Aim: Compare the post operative outcomes of osteochondral autologous transplantation (OATS) and matrix associated stem cell transplantation (MAST), as primary and revision procedures Methods: Prospective study of OATS and MAST from 2013 to 2023, in a single surgeons practice Primary study outcome: rate of revision. Secondary outcomes: PROMS (VAS and FAOS), complications and return to sports. Data collected via chart, radiological review, and telephonic survey. Inclusion criteria: aged 16 years and above; OLTs greater than 10mm<sup>2</sup>, Primary and Revision. Exclusion criteria: Unable to/Refused consent (N=1), Rheumatological joint disease (N=1), Degenerative joint. Lost to follow up. Statistical analysis with Chi-squared test, Fischers exact test, Wilcoxon sum test, and linear regression. Results: N=90. Equal distribution of OATS being used for primary and for revision (50% (16) /50% (16)), MAST had a slight prevalence of revision over primary (55% revision (32) / 45% primary (26) p 0.6). There was a significant association between prior surgery and the need for a revision procedure in the MAST cohort. ( $\hat{I}^2 = 1.491$ , SE = 0.562, p = 0.008). Return to sport was seen in 90% of the OAST and 67% of MAST (p 0.11). There was statistically significant improvement in PROMs for both techniques (VAS and FAOS), but no significant change between the outcomes in primary versus revision surgeries. Conclusion: OATS is an appropriate technique for managing OLTs, both as a primary and salvage procedure, with significant improvement of PROMS (VAS and FAOS), and elevated rate of return to sports (90%). MAST as a primary intervention showed similar outcomes to those of OATS, but poorer outcomes as a salvage procedure, with higher rates of revision thereafter (p .01).

## FP9

### A National survey of BOFAS members on the treatment of primary osteochondral defects of the talus

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**Introduction:** Osteochondral defects (OCDs) of the talus were identified as a “TOP 10” research priority in foot and ankle surgery by the James Lund Alliance in partnership with BOFAS, BOA and NIHR. To develop a research strategy, the views of BOFAS members regarding OCDs of the talus were surveyed. The results are reported here.

**Methods:** A questionnaire concerning the presentation, investigation and management of OCDs was formulated with input from the BOFAS National Clinical Study Group and ratified by the Scientific Committee. It concerned primary OCDs of the talus that had failed non-surgical management. It was distributed to BOFAS members via email using \_Microsoft Forms\_.

**Results:** There were 90 responses. Data on presenting symptoms, investigations, initial management and decision making was collected. Surgical treatment was grouped according to defect size: small or large and shallow or deep. This gave 4 categories. For the purposes of the study a large defect had a width >15mm and a deep defect had a depth >5mm. For small, shallow lesions 85 respondents chose microfracture as the first line surgical treatment. For large shallow lesions 59 respondents chose microfracture, 18 chose bone marrow stimulation plus scaffold e.g. AMIC or ACIC and 6 chose bone marrow stimulation plus a biological agent e.g. cBMA or PRP. For small deep lesions microfracture was again most popular (69 respondents). For large deep lesions microfracture was chosen by 43 respondents, AMIC/ACIC by 23 and OATs by 7. Further data was collected on post op rehabilitation.

**Discussion:** The study demonstrates that microfracture is the most popular first line treatment for primary OCDs of the talus of any size. That said, a wide range of treatments are in practice. This information will facilitate the development of high-quality studies to identify the most appropriate evidence-based treatment for OCDs of the talus.

## FP10

### The Classification, Pathoanatomy and Radiological Outcomes of Medial Wall Blowout Fractures of the Ankle

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**Background:** Medial wall blowout (MWB) ankle fractures have not previously been described in the literature. Our aim in this study was to analyse the morphology of medial wall blowout fractures and their radiological outcomes.

**Methods:** The MWB fracture fragments were characterised into four groups. A type 1A fracture was described as an anteromedial column fragmentation. Type 1B fractures consisted of posteromedial column fragmentation. Type 2 fracture consisted of both column wall fragmentation and type 3, any medial wall fragmentation with medial joint impaction.

**Results:** Over 2000 patients were identified across ten years with medial malleolar fractures across two centres; of these, 196 had MWB fractures with CT imaging. There were 95 1A fractures (48.5%), 31 1B fractures (15.8%), 40 Type 2 fractures (20.4%) and 30 type 3 fractures (15.3%). Type 1B fractures were significantly more likely to undergo plate fixation than other types (p = .001).

MWB fractures occurred most in PER fracture types (50.8%). Type 2 fractures were different because they occurred more with SER-type mechanisms. PM fractures were a common association (82.4%), most commonly M+M type 1. MWB type 1B occurred more with M+M 2B fractures.

The overall malreduction rate was 11.8%, although 1B fracture types had significantly higher malreductions (22.6%, p=.041). The overall nonunion rate was 20.6%, the highest nonunion reported in the type 2 fractures (33.3%), although not significant. Tibialis posterior tendon entrapment was common (47.3%), although it was significantly more likely in type 2 fractures (74.4%, p = 0.001).

**Conclusion:** The MWB fractures are an uninvestigated subtype of ankle fractures. The 1B type has a higher rate of malreduction, which could be due to its higher association with PM fractures. Tib post needs specific attention with these fracture types, especially Type 2 fractures.

## FP11

### Fifth Metatarsal Fracture Pattern Mapping and Associated Outcomes - An Observational Cohort Study

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**Introduction:** Fifth metatarsal fractures have been regularly classified by zones, with the description of a Jones fracture commonly being misrepresented. The aim of this study was to map the fracture patterns across the entire metatarsal shaft, and correlate with their outcomes.

**Methods:** A historic cohort study was completed of all fifth metatarsal fractures presenting to our unit between February 2016 - July 2021. Fracture patterns were individually mapped and designated as zone 1-shaft, including designation of fractures which bridge each zone (zone 1-2 etc). Fracture patterns were cumulatively combined using GNU Image Manipulation Program to show the combined fracture map patterns per outcome. The clinical notes were examined to assess patient outcome.

**Results:** 1331 fractures were included in this study and presented graphically as fracture maps by outcome. The number of fractures which did not propagate across more than 1 zone was 78.59% (1046/1331). The fracture type which had the highest rate of discharge at VFC without reattendance was Zone 1 fractures (360/519, 69.36%), with the lowest being fractures where the fracture spanned zone 1-shaft (p<0.001).

The total number of fractures that underwent surgery was 1.35% (18/1331). The fracture pattern which had the highest rate of surgical intervention was a fracture that spanned zone 2-3 (5/43, 11.63%) followed by a fracture that spanned zone 1-3 (1/11, 9.9%).

The number of appointments given to patients ranged from discharged from VFC to 7 face to face appointments. The patients with the lowest discharge rate prior to 4 appointments was zone 2-3.

**Conclusions:** In our series, almost a quarter of fractures spanned across the previously described fracture zones. This would explain the low inter-observer rating in previous studies. The classic Jones fracture would span zones 2/3, which in our series had the highest rate requiring surgery and lowest rate of discharge before 4 appointments.

## FP12

### Gravitational stress views overestimate ankle instability and may commit patients to unnecessary surgery: a prospective series with 10 year follow up

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**Background:** Distinguishing stable from unstable ankle fractures is key to successful ankle fracture management. Gravitational stress views (GSV) may be a convenient and less painful alternative to manual stress testing. The aim of this study was to assess whether this test accurately predicts ankle instability.

**Methods:** Patients presenting to a single trauma centre between 2011 and 2013 with an isolated fibula fracture and an anatomically-aligned mortise on initial plain film radiographs were reviewed. After initial x-ray, patients underwent a gravity stress view. Measurements from plain film radiographs were recorded and analysed. Electronic case notes and National Imaging Archives were reviewed retrospectively at a minimum of 10 years post-injury. Patients were contacted to complete patient reported outcome measures (PROMS).

**Results:** One-hundred and forty-two (142) patients met the inclusion criteria and were included in the study. Mean initial film medial clear space (MCS) measurement was 3.46mm (1.0 to 6.0) compared to GSV MCS that was 4.9mm (2.0 to 8.8) (p<0.001). No patient underwent surgery and all patients had successful conservative management with anatomical union seen at their 6 week radiograph. No patient returned with a complication related to their ankle fracture during the follow-up period. With a MCS acquired from GSV of >5mm, 65 patients would have undergone unnecessary surgical intervention. At MCS of >6mm, 26 patients would have undergone surgery unnecessarily and at a MCS of >7mm 10 patients would have had unnecessary surgery. To date, 50 patients have provided PROMS. Mean Olerud and Molander Score (OMAS) at 10 years was 86.63 (SD 23.27, 95% CI 79.47 - 93.79), Manchester Oxford Foot Questionnaire (MOXFQ) was 79.41 (SD 32.94, 95% CI 69.39 - 89.42) and Euroqol-5D-3L was 0.86 (SD0.22, 95% CI 0.79 - 0.93).

**Conclusion:** Stress views may over-diagnose instability in patients with an isolated fibula fracture in an otherwise normal initial radiograph.

### The Impact of Achilles Tendon Rupture on the Structure and Function of the Achilles Tendon and Plantarflexors after Non-Surgical Management: A Cross-Sectional Study

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**Introduction:** Acute Achilles Tendon Ruptures (ATR) cause lasting muscular deficits and impair function and quality of life. This study aimed to understand recovery post rupture by examining tendon structure using ultrasound tissue characterisation (UTC), isometric plantarflexor strength, physical activity and patient reported outcomes (PROM).

**Methods:** Cross-sectional study design consisting of 90 participants. Data were collected from 15 participants at six different rehabilitation timepoints (0, 8, 10 weeks, 4, 6, 12 months). Participants were recruited from a National Health Service clinic using non-surgical management.

**Findings:** Participants mean (SD) age 48 years (16), 91% male, body mass index 29kg/m<sup>2</sup>, 54% white British with a median of 1 comorbidity. Primary mechanism of injury was sport (71.1%). Deep vein thrombosis rate was 9.3%.

Based on UTC, ruptured tendon cross-sectional area (CSA) was 287.55 mm<sup>2</sup> at 10 weeks, 203.62mm<sup>2</sup> at 12 months. Disorganised fibrillar structure was 32% lower at 12 months than 10 weeks. Disorganised fibre percentage was consistent at each assessment point (10 weeks:32%, 12 months:30%).

Isometric plantarflexor strength on the ruptured limb at 12 months was 61.3kg (20.8) or 0.7x body weight (BW) whilst the non-ruptured limb was 93.3kg (29.5) or 1.1x BW. Daily steps increased from 3720 (1889.8) at week 0 to 9048.4 (2750.1) at 12 months.

PROMs at 12 months; ATRS 75.1 (16.5), EQ-5D index .91, EQ-5D VAS 75 (23), SF-36 Physical Functioning 84.3 (9.2), Tampa Scale for Kinesiophobia 34.7 (4.8).

**Conclusion:** There is substantial remodelling of the tendon during the initial 12 months post ATR, with tendon CSA differing 29% across assessment points. Proportion of disorganised collagen remains consistent from 10 weeks to 12 months post ATR, whilst CSA reduces. Individuals presenting with ATR managed non-surgically have a 34% or 0.4xBW isometric strength deficit at 12 months and still present with fear of movement and reduced function based on PROMs

### Does the measure of Achilles Tendon Resting Angle correlate with outcome after functional bracing and rehabilitation for Achilles rupture? Fourth Generation Percutaneous Transverse Osteotomies for Hallux Valgus: A series of 729 feet

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**Background:** Acute Achilles tendon ruptures can be a devastating injury with a prolonged recovery period (1). Following the UKSTAR trial, Achilles tendon ruptures are predominately treated with a functional rehabilitation bracing program (2). The aim of treatment is to avoid lengthening of the tendon, and hence the resultant loss of function. The Achilles tendon resting angle (ARTA) provides a simple assessment of tendon length that can be performed in the clinical setting (3). This study assesses the Achilles tendon resting angle over a 52-week period and the correlation with functional outcome.

**Methods:** A total of 182 consecutive patients with an acute Achilles tendon rupture were treated with a 10-week functional rehabilitation regime. The relative Achilles tendon resting angle was recorded as the difference between the limbs at the time of injury, then once treatment commenced at 4-, 11-, 26- and 52-weeks post injury. Patients with a previous Achilles rupture of the contralateral leg were excluded. The functional outcome was assessed using the Achilles tendon rupture score at 26- and 52-weeks post injury.

**Results:** The relative Achilles tendon resting angle improved by 5 degrees with functional bracing and plateaued after 11 weeks post injury. The functional outcome continued to improve to 52 weeks post injury with a mean ARTS of 77.9 (15.1). No correlation was detected between the ARTA and ARTS at either 26- or 52- weeks. Only one patient sustained a re-rupture.

**Conclusion:** Functional bracing reduces the extent of tendon lengthening and improves the functional outcomes of patients up to a year post-injury. The relative ARTA as part of clinical assessment however, fails to provide an indication of the long-term functional outcome of these patients.

### Mortality, re-amputation and post operative complication rates following 28,000 below knee amputation in diabetic patients in England: a national population study 2002-2022.

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**Introduction:** Global data on BKA mortality is dominated by US Veterans population studies, while smaller single-centre UK cohorts observe a wide range of 1 year mortality (13.8%-61.1%). There is no consensus on mortality rates, perioperative complications and at-risk groups post diabetic BKA in England.

**Methods:** England Hospital Episodes Statistics (HES) data was combined with ONS mortality data (2000-2022) and cleaned using STATA 18. The primary outcome was the rate of all cause mortality. Secondary outcomes were causes of death, re-amputation rates, temporal variation in mortality, and 90 day peri-operative complications.

Mortality and amputation free survival was calculated with Kaplan-Meier curve analysis using R, STATA 18. Multivariate logistic regression stratified patient variables associated with mortality and/or re-amputation rate.

**Results:** 28,045 BKA were performed for diabetes in the 20-year period; decreasing from 8.1/100,000 (2002) to 6.5/100,000 (2022). The rates were significantly higher in white males aged 60-79 years old (14/100,000 in 2023).

The mortality rates following BKA for diabetic foot disease were 7.1% at 30 days, 12.7% at 90 days, 24.6% at 1 year, and 61.2% at 5 years. Only 17% of patients survived to 10 years post BKA.

The 90-day reoperation rate for any cause was 20.7%. The ipsilateral re-amputation rate at any time was 10.4% (n=2909), and the contralateral amputation rate was 8.2% (n=2304). Additional 90-day complications included PE (0.75%, n=211), MI (3.6%, n=1019) and Stroke (1.1%, n=316).

Multi-regression analysis demonstrated significantly higher BKA associated mortality rates at all time points in male, British-Asians with higher deprivation status.

**Conclusions:** This landmark 20-year England diabetic population study has revealed high rates of death, further amputation and peri-operative morbidity post BKA. Asian Males in their 60s have the highest mortality rates and represent an at-risk group. Overall, there has been little improvement in post BKA mortality over the last 20 years

### Diabetic Midfoot Charcot- When to operate, a staged approach to decision making.

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**Introduction:** Diabetic midfoot Charcot neuroarthropathy (CN) is a progressive condition which presents as a hot swollen foot to a rocker bottom deformity with ulcer and resultant osteomyelitis. Literature report of a subjective indications for surgery generally after a failed prolonged immobilization in a total contact cast. The aim of this study is to define objective indications of progression of midfoot CN and interventions at each stage of the disease.

**Patients and Methods:** Notes and radiographs of consecutive patients presented to Basildon Diabetic foot unit since 2018 with midfoot CN were reviewed. Inclusion criteria were all patients with midfoot CN and were followed for a minimum 12 months with radiographs. Exclusion criteria were patients lost to follow before 12 months or where inadequate radiographs were available. Patients with ankle/ subtalar Charcot were excluded.

**Results:** A total of 182 patients with midfoot CN were seen since 2018, of these 88 patients underwent surgical reconstruction. 3 radiographs features: lateral Mearys angle, calcaneal pitch and cuboid height were noted to be diagnostic for diagnosis and monitoring of the progression of the midfoot CN. 5 stages of disease were described (Basildon classification) with stage 1 and 2 were managed with percutaneous tendo-Achilles lengthening (TAL). Progression of above radiological parameters is an indication for surgical stabilisation. Lateral column involvement is indicated by the drop in cuboid height which rapidly progresses to ulcer formation.

**Conclusion:** Motor neuropathy induced stiff and contracted muscles results in progressive midfoot CN. The radiological markers described are shown to be reliable and reproducible indices for the progression of the disease process. In-clinic procedures such as TAL has shown to slow or revert the earlier stages of disease, however worsening of these markers are reliable guide for indication for surgical stabilisation."

## FP18

### Is the Distal Metatarsal Metaphyseal Angle really just Metatarsal Pronation?

#### A weightbearing CT analysis

Mr Arvind Vijapur<sup>1</sup>, Mr Mohammed Shaath<sup>1</sup>, Mr Shelain Patel<sup>1</sup>, Mr Nick Cullen<sup>1</sup>, Mr Matthew Welck<sup>1</sup>, Mr Karan Malhotra<sup>1</sup>

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**Aims:** The distal metatarsal metaphyseal articular angle (DMMA) is a measurement used in the surgical decision making of hallux valgus correction. However, it is difficult to measure on plain radiographs, is subject to projection bias, and its role in pathology is unclear. With the advent of weight-bearing CT (WBCT), our understanding of hallux valgus as a multiplanar deformity has evolved. The aim of this study was to investigate whether there is a relationship between the DMAA and pronation of the first metatarsal head in patients with hallux valgus.

**Methods:** This was a single-centre, retrospective analysis of 50 patients with hallux valgus deformity who had WBCTs obtained as part of routine pre-operative work-up. Patients with metatarsophalangeal joint arthritis, hindfoot deformity and previous surgery were excluded. From the WBCT images digital radiographs were created and the DMMA measured. Measurements were taken by 2 authors, each repeated twice and the average of all four measurements used in analysis. We also measured intermetatarsal angle (IMA), hallux valgus angle (HVA) and metatarsal pronation angle (MPA).

**Results:** There were 41 females and 9 males, mean age 52.4±15.8 years. IMA was 14.5±3.3 degrees, HVA was 29.3±8.4 degrees, MPA was 11.7±6.3 degrees, and DMMA was 15.5±5.3 degrees. Intraclass correlation coefficient (ICC) for intra-observer reliability was 0.829 for assessor 1 and 0.910 for assessor 2. ICC for inter-observer reliability was 0.727. Pearsons correlation revealed no link between IMA and DMAA, nor HVA and DMMA. However, there was a significant (albeit small) correlation between MPA and DMMA (r=0.337, p=0.017).

**Conclusion:** There was reasonable reliability in measuring DMMA between authors on WBCT. Despite this, DMMA appeared to increase with increasing metatarsal pronation. The DMMA may therefore be (in part) projection artefact secondary to metatarsal pronation and surgeons should be aware of this during surgical planning.

## FP19

### Fourth Generation Percutaneous Transverse Osteotomies for Hallux Valgus: A series of 729 feet

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**Background:** Fourth-generation percutaneous or minimally invasive hallux valgus surgery utilizes a transverse osteotomy to achieve deformity correction. There are only a small number of series reporting the clinical and radiological outcomes of transverse osteotomies, many of which have methodological limitations such as small sample size, limited radiographic follow up or use of non-validated outcome measures. The aim of this study was to provide a methodological robust investigation into percutaneous transverse osteotomies for hallux valgus deformity.

**Method:** A prospective series of consecutive patients undergoing fourth generation metatarsal extra-capsular transverse osteotomy (META) performed by a single surgeon (PL) between November 2017 and January 2023. The primary outcomes were radiographic deformity correction and clinical foot function assessed using the Manchester-Oxford Foot questionnaire (MOXFQ). Radiographic deformity (Hallux valgus angle (HVA) and intermetatarsal angle (IMA), sesamoid position) was assessed according to AOFAS guidelines. Secondary outcomes included Visual Analogue Scale for Pain and radiographic deformity recurrence (defined as HVA >20° at final radiographic follow up).

**Results:** 729 feet from 483 patients (456 Female, 27 Male, mean age 57.9±11.9 years) underwent META. Radiographic data (minimum 12 months post-surgery) was available for 99.7% of feet with mean follow up of 2.6±1.3 years (range 1.0-5.7). There was a statistically significant improvement (p<0.05) in both HVA; 29.5±8.5° to 7.3±6.7°, and IMA, 12.9±3.4° to 4.6±2.5°. All MOXFQ domains showed significant improvement (p<0.05); Index 36.6±19.1 to 11.8±13.8, Pain 40.1±22.1 to 15.6±16.4, Walking/Standing 32.2±23.2 to 10.2±15.8 and Social Interaction 40.0±20.6 to 9.7±14.0. The recurrence rate was 4.5% (n=33). The complication rate was 6.1% which included a screw removal rate of 2.9%

**Conclusion:** This is the largest consecutive series of any percutaneous osteotomy technique to correct hallux valgus deformity. This study demonstrates that the technique leads to significant improvement in clinical and radiographic outcomes with a low rate of recurrence.

## FP20

### Does clinical pronation of the toe correlate with metatarsal rotation? A Retrospective analysis of weightbearing CT images.

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**Aims:** First metatarsal Pronation is increasingly recognised as an important component of Hallux valgus (HV) and can contribute towards intraoperative malreduction, postoperative recurrence and patient reported outcome measures (1,2,3). There are numerous radiological ways to measure metatarsal rotation on plain radiographs and weight bearing CT (WBCT), however there are no clinical tests to evaluate metatarsal pronation pre- or intra-operatively. This study therefore aimed to examine the relationship between clinical pronation of the toe and metatarsal pronation.

**Methods:** Single-centre, retrospective analysis over 5 years. Measurements were performed on WBCT images with digital reconstructions to add soft tissues. First metatarsal rotation was measured using the Metatarsal Pronation Angle as previously described (4). Toe rotation was measured by the Phalangeal Condylar Angle (PCA), the angle between the condyles of the proximal phalanx and the floor, and the Nail Plate Angle (NPA), the angle of the base of the nail plate to the floor in the coronal Plane. These were obtained from 50 feet in Hallux valgus patients, and 50 control patients with CTs done for osteochondral lesions without hallux valgus or hindfoot malalignment.

**Results:** The HV group comprised 41 women and 9 men, mean age 52.4. Control group, 23 women and 23 male, mean age 40.25. Inter and Intra Observer reliability both excellent (ICC >0.95) for all measurements. When comparing HV vs control, MPA was 11.7 vs 6.0 (p<0.001), PCA 31.8 vs 4.7 (p<0.001), NPA 18.3 vs 6.0 (p<0.0001). NPA correlated with PCA. NPA and PCA correlate with Hallux valgus Angle (p<0.001), but not with MPA (p 0.567).

**Conclusion:** These results suggest that clinical toe pronation increases as HV angle increases but not with metatarsal pronation, which therefore cannot be used as a clinical marker. Toe pronation is similar at the base and at the nail, suggesting rotation happens at the MTPJ.

## FP21

### Minimally Invasive Chevron Akin for Hallux Valgus Surgery: A Prospective Observational Study with Mean 6.7 year Follow Up

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**Introduction:** Minimally invasive (percutaneous) distal first metatarsal osteotomy with internal fixation is an established technique for hallux valgus deformity correction. Published data is limited to 2-3 years follow-up. This study aimed to assess patients undergoing MICA (Minimally Invasive Chevron and Akin) with minimum 5-year follow up, to evaluate the longer-term results of this procedure using validated patient reported outcome measures (PROMs).

**Methods:** Five-year PROM data was prospectively collected from 117 patients who underwent 169 primary MICA osteotomies between July 2014 and April 2018, performed by a single surgeon. Primary clinical outcome measures included visual analogue scale for pain (VAS-pain), Manchester-Oxford Foot Questionnaire (MOXFQ) and EuroQoL-5 Dimensions Index (EQ-5D). Data were collected preoperatively, at 2 years and after a minimum of 5 years. Statistical significance was set at p< 0.05.

**Results:** 169 MICA were performed on 117 patients (112 females, 5 males). Mean follow-up was 6.7 years (standard deviation (SD) 0.96 years). All patients completed minimum 5-year follow-up scores. The MOXFQ scores (mean ± SD) for all 169 feet improved for all domains: from 44.5 ± 22.1 preoperatively to 10.3 ± 17.0 post-operatively for Pain (p<0.001), from 39.2 ± 24.5 to 9.3 ± 17.9 for Walking and Standing (p<0.001) and from 48.2 ± 22.8 to 8.7 ± 17.6 for Social Interaction (p<0.001). VAS-pain improved from 30.8 ± 22.7 to 12.9 ± 21. (p<0.001). EQ-5D Index improved from 0.74 ± 0.14 to 0.90 ± 0.12 (p<0.001).

**Conclusion:** This is the largest study at this time point presenting PROM data following minimally invasive distal first metatarsal osteotomy. It is also the longest in follow up for this technique. This study demonstrates significant improvement in PROMs at the mid-term and MICA can be considered as an effective and long-lasting option for the management of hallux valgus deformity.





P1

**Evaluating Lapiplasty Outcomes for Hallux Valgus: A Retrospective Study**

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P2

**Surgery for 1st MTP joint arthritis - outcomes from the BOFAS registry**

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**Effects of Mecobalamin on the functional outcomes of complex regional pain syndrome type 1 of the foot and ankle.**

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**A prospective clinical and biomechanical analysis of feet following first metatarsophalangeal joint arthrodesis for end stage hallux rigidus.**

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**A comparison of 1st MTPJ arthrodesis and total joint replacement, a clinical and biomechanical analysis.**

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**Evaluation of Tendon-to-Tendon Versus Tendon-to-Bone Transfers in Charcot-Marie-Tooth Foot Surgery**

Mr Mohammed Shaath<sup>1</sup>, Miss Ella McCarthy<sup>2</sup>, Mr Gilles Van Eetvelde<sup>1</sup>, Mr Muhammad Chatoo<sup>1</sup>,

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**The Inaugural United Kingdom National Hallux Valgus Think Tank: Identification of Key Issues and Strategies to Improve Clinical Care for Patient Benefit**

Mr Tom Lewis<sup>1</sup>, Mr Abbas See<sup>2</sup>, Dr Linzy Houchen-Wolloff<sup>3</sup>, Mr Jitendra Mangwani<sup>3</sup>,

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**The role of EUA and MRI scans in the evaluation of chronic symptomatic ankle instability- MRI findings of intact ligament doesn't imply functional lateral ligament complex**

Mr George Koshy<sup>1</sup>, Mr Aysha Rajeev<sup>1</sup>, Mr Kailash Devalia<sup>1</sup>

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**An Audit of Ankle Arthritis Network: Preliminary Nottingham experience and Patient satisfaction.**

Dr Martin Raglan<sup>1</sup>, Miss Yulanda Myint<sup>2</sup>, Mr Vail Karuppiah<sup>2</sup>, Mr Nicholas Duncan<sup>3</sup>, Mr Steve Milner<sup>4</sup>,

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**A Retrospective Review of Clinical Outcomes Comparing Unstable Ankle Fractures With and Without a Posterior Malleolus Fracture**

Mr Nicholas Heinz<sup>1</sup>, Dr Shawn Fredrick<sup>2</sup>, Mr Anish Amin<sup>3</sup>, Mr Andrew Duckworth<sup>4</sup>,

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**Reducing the Risk: How Surgeon Expertise Influences Post-Traumatic Osteoarthritis in Ankle Fractures**

Mr Alexander Jaques<sup>1</sup>, Mr Karim Abdelghafour<sup>1</sup>, Mr Simon Mordecai<sup>1</sup>, Mr Rupinderbir Deol<sup>1</sup>,

Mr Karan Johal<sup>1</sup>

<sup>1</sup>East and North Hertfordshire NHS Trust

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**Psychological and functional assessment of Achilles Tendon Ruptures and their return to sports**

Dr. Rahul Mohan Kumar<sup>1</sup>, Abdul-Rahman Gomaa, Mr. Dan Scarffe<sup>2</sup>, Mr. Benjamin Jones<sup>2</sup>,

Ms. Ashka Moothosamy<sup>2</sup>, Mr. Nikesh Someswaran<sup>3</sup>, Mr. Andy Molloy<sup>2</sup>, Prof. Lyndon Mason<sup>1</sup>

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**Fat Transfer for Plantar Heel Pain: A Case Series**

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**Comparative Biomechanical Study of Different Screw Fixation Methods For Minimally Invasive Hallux Valgus Surgery: A Finite Element Analysis**

Mr Thomas Lewis<sup>1</sup>, Ms Ayla Newton<sup>1</sup>, Mr Henrique Mansur<sup>2</sup>, Mr Gabriel Ferreira<sup>3</sup>, Mr Miguel Filho<sup>4</sup>, Mr Leonardo Battaglion<sup>5</sup>, Mr Roberto Zambeli<sup>6</sup>, Mr Robbie Ray<sup>1</sup>, Mr Gustavo Nunes<sup>7</sup>

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**A Retrospective 10-year Review of Patient Reported Outcome Measures Comparing Unstable Ankle Fractures With and Without a Posterior Malleolus Fracture**

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**Infection following foot and ankle surgery: Further analysis of data captured from the UK FATE Audit**

Miss Jenna Shepherd<sup>1</sup>, Prof. Lyndon Mason<sup>2</sup>, Miss Linzey Houchen-Wolloff<sup>3</sup>, Mr Karan Malhotra<sup>4</sup>,

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**Accessing the Posterior Malleolus: The posterolateral or medial posteromedial approach?**

Mr Abdul-Rahman Gomaa<sup>1</sup>, Dr Richard Huynh<sup>1</sup>, Mr Mohamed Abdellatif<sup>1</sup>, Mr Hakim Ben Nusir<sup>1</sup>, Ms Gabrielle Jones<sup>1</sup>, Dr Cameron Kennedy<sup>1</sup>, Dr Ashka Moothoosamy<sup>1</sup>, Prof Lyndon Mason<sup>1</sup>

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**Clinical Results of Bio-Integrative Fiber-Reinforced Implants for Hammertoe Correction: A Review of Surgical Outcomes**

Dr. Thelma Jimenez<sup>1</sup>, Dr. Taylor Wingo<sup>1</sup>, Dr. Hugo Ubillus<sup>1</sup>, Dr. Raymond Walls<sup>1</sup>

<sup>1</sup>NYU Langone Health

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**Sagittal alignment following ankle and tibiototalcalcaneal arthrodesis: A retrospective review of radiological and patient reported outcomes**

Mr Prashant Singh<sup>1</sup>, Ms Amy Still<sup>1</sup>, Mr Karan Malhotra<sup>1</sup>, Mr Shelain Patel<sup>1</sup>, Mr Nick Cullen<sup>1</sup>, Mr Matthew Welck<sup>1</sup>

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**Hallux Valgus surgery and 1st MTPJ fusion Outcomes from the BOFAS Registry.**

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POSTERS  
ABSTRACT DETAILED

## P1

### Evaluating Lapiplasty Outcomes for Hallux Valgus: A Retrospective Study

Dr. Thelma Jimenez<sup>1</sup>, Dr. Yasamin Daneshvar<sup>1</sup>, Dr. Jasmeet Chawla<sup>1</sup>, Dr. Uzaam Syed<sup>1</sup>, Dr. Jeffrey Lucido<sup>1</sup>, Dr. Paul Greenberg<sup>1</sup>, Dr. Rick Delmonte<sup>1</sup>, Dr. Raymond Walls<sup>1</sup>

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**Introduction:** Hallux valgus (HV) is a common triplanar deformity of the metatarsophalangeal (MTP) joint, affecting over 20% of individuals aged 18 to 65 and more than 35% of those over 65.[1] Traditional treatments often rely on two-dimensional assessments, leading to high recurrence rates. [2-4] Recent advancements in imaging highlight the need to address HV's three-dimensional complexity. The Lapiplasty procedure has emerged as a promising technique for correcting HV deformities in all three planes, potentially reducing recurrence and expediting recovery. This study evaluates the outcomes of the Lapiplasty procedure.

**Methods:** A retrospective review assessed outcomes of the Lapiplasty procedure performed between 2020 and 2024 at a single urban academic medical center. The study included a minimum follow-up of six months. Primary outcomes measured were changes in intermetatarsal angle (IMA), hallux valgus angle (HVA), and tibial sesamoid position (TSP). Secondary outcomes included union rates, complication rates, and postoperative weight-bearing status.

**Results:** Fifty patients met the inclusion criteria, with a mean age of 53.8 years and a mean BMI of 26.5. The cohort included 40 females and 10 males. The average follow-up was 19.3 months. Patients achieved full weight-bearing in a CAM boot at 3.7 weeks and transitioned to sneakers by 7.5 weeks. Radiological outcomes showed significant improvements: IMA decreased from 17.5 to 4.5 degrees, HVA improved from 34.9 to 9.2 degrees, and TSP decreased from 6.4 to 3.4. Complications were reported in 52% of patients, including hardware removal, paresthesia, and bony complications such as asymptomatic nonunion and hallux varus.

**Discussion:** The Lapiplasty procedure significantly improves radiological outcomes for HV deformity. While it shows robust correction, the high complication rate indicates areas for improvement. Further research with larger sample sizes and extended follow-up is needed to validate these findings and optimize treatment strategies.

## P2

### Surgery for 1st MTP joint arthritis - outcomes from the BOFAS registry

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**Introduction:** Symptomatic 1st MTP joint arthritis is common (7.8% prevalence reported in adults over 50 years in the UK [1]). Established surgical treatments include 1st MTPJ fusion, 1st MTPJ arthroplasty and 1st MTPJ cheilectomy. Utilising BOFAS registry to evaluate outcomes from these treatments has the advantage of providing high volume cohort observational data from the UK population.

**Methods:** A BOFAS registry database analysis was performed to identify all patients who had undergone surgery for 1st MTPJ arthritis. Demographic data and functional scores (MOXFQ/VAS) at baseline and 12 months post-operative were evaluated.

**Results:** 1508 1st MTPJ fusions, 28 1st MTPJ arthroplasties and 218 1st MTPJ cheilectomies were identified. The 1st MTPJ cheilectomy group demonstrated a significantly lower baseline ( $p < 0.001$ ) for MOXFQ/VAS scores compared to the other cohorts, although this was lower than the MCID [2, 3].

35.71% in the 1st MTPJ Arthroplasty cohort, 26.15% in the 1st MTPJ Cheilectomy cohort and 16.46% in the 1st MTPJ fusion cohort had complete data collection allowing comparison of PROM score difference at 12 months. 1st MTPJ fusion and 1st MTPJ cheilectomy groups demonstrated both a statistical and clinically significant improvement in all MOXFQ/VAS components at 12 months. There was significantly greater improvement in MOXFQ/VAS scores in the 1st MTPJ fusion group and 1st MTPJ Cheilectomy group compared to the 1st MTPJ Arthroplasty cohort.

**Conclusion:** Acknowledging the limitations of our analysis due to low follow-up rate, our data suggests 1st MTPJ fusion and 1st MTPJ arthrodesis lead to greater improvements in functional outcome than 1st MTPJ arthroplasty. We note the relatively low numbers of MTPJ arthroplasty patients in our data-set which may lead to bias; we therefore recommend and encourage surgeons performing this procedure to submit registry data to allow ongoing evaluation.

## P3

### Effects of Mecobalamin on the functional outcomes of complex regional pain syndrome type 1 of the foot and ankle.

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**Purpose:** The objective is to evaluate the effects of Mecobalamin on the functional outcomes in patients with complex regional pain syndrome (CRPS) type 1 of the foot and ankle.

**Methods:** Forty seven patients diagnosed with acute complex regional pain syndrome type 1 of the foot and ankle were recruited. Patients were randomly allocated into a control group (23 patients) and a Mecobalamin group (24 patients), both receiving similar pain control medications and rehabilitation programs. Three divided doses of mecobalamin 1.5mg/day were provided to the Mecobalamin group for the first 3 months, whereas a placebo was administered to the control group. Data was collected from the pre-treatment period, and from 1, 3, 6 and 12 months following the treatment.

**Results:** Both groups had similar demographics. The mean FAAM-ADL and FAAM-sport in the Mecobalamin group at 3 months were 74.5±17.9 and 56.3±22.9, respectively, whereas the mean FAAM-ADL and FAAM-sport in the placebo group at 3 months were 62.2.5±15.2 and 43.4±14.9, respectively. There was a statistically significant difference ( $p < 0.05$ ) between the FAAM-ADL and FAAM-sport scores of the Mecobalamin group and the control group. The SF-36 Mental Health subscale after 3 months was 83.3±9.5 points and 75.8±12.6 points in the Mecobalamin and placebo group, respectively. There was a statistically significant improvement in the SF-36 Mental Health subscale score in the Mecobalamin group. Both the amount and duration of total Pregabalin used in the Mecobalamin group was significantly lower than the control group. The pain scores of both groups had no statistical significance.

**Conclusion:** This small study revealed a statistically significant improvement of the functional outcomes in patients with CRPS type 1 of the foot and ankle who received Mecobalamin instead of a placebo, as well as a statistically significant reduction in the amount and duration of total Pregabalin used in the Mecobalamin group.

## P4

### A prospective clinical and biomechanical analysis of feet following first metatarsophalangeal joint arthrodesis for end stage hallux rigidus.

Professor Rohan Rajan<sup>1</sup>, Mr Jyoti Shrestha<sup>2</sup>, Mr Vishal Upadhyay<sup>2</sup>, Mr Jabez Vhanda<sup>2</sup>, Mr Daniel Ananda-Rajan<sup>3</sup>

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**Background:** Hallux Rigidus is the result of degeneration of the 1st metatarsophalangeal joint (1st MTPJ). In end-stage hallux rigidus, treatment is mainly surgical with arthrodesis being a favourable option. Although the biomechanical effects of arthrodesis have been examined, a detailed comparison of pre- and post-operative biomechanics has yet to be conducted.

**Research Question:** Does 1st MTPJ arthrodesis positively affect foot kinematics and plantar pressure distribution?

**Methods:** Twelve 1st MTPJ arthrodesis were performed in patients with a mean age of 53.5 ± 5.4 years and follow up time of 6.9 ± 1.0 months. Pre- and post-operative data were collected at a CMAS (Clinical Movement Analysis Society) accredited gait laboratory using a BTS motion capture system and pedobarographic pressure plates. Patient outcome measures were also assessed using the MOXFQ. Statistical analysis was conducted using a two-way repeated measures ANOVA.

**Results:** Significant increases in stride length, cycle duration and cadence were identified following 1st MTPJ arthrodesis. A significant reduction in forefoot-hallux dorsiflexion at toe-off was identified for the operated foot from the pre-operative (20.23 ± 5.98°) to post-operative (7.56 ± 2.96°) assessment. Post-operative sagittal and transverse plane changes in the operated foot were also identified. Peak pressure and PTI results indicated significant lateralisation of load for the operated foot, but importantly this was not influenced following arthrodesis. Finally, there was a significant improvement in MOXFQ score.

**Conclusion:** Following 1st MTPJ fusion there is an improvement in overall gait mechanics which accompanied by the improved MOXFQ score indicates a reduction in pain and improved confidence during gait. Lack of post-operative dorsiflexion at forefoot-hallux caused load to remain lateralised and compensatory mechanisms to occur at the more proximal joints within the foot. These results provide valuable information for clinicians enabling more accurate counselling to be provided to patients with end-stage hallux rigidus.

P5

### A comparison of 1st MTPJ arthrodesis and total joint replacement, a clinical and biomechanical analysis.

Professor Rohan Rajan<sup>1</sup>, Mr Jyoti Shrestha<sup>1</sup>, Mr Vishal Upadhyay<sup>1</sup>, Mr Jabez Vhanda<sup>1</sup>, Mr Daniel Ananda-Rajan<sup>2</sup>

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**Background:** Both 1st MTPJ arthrodesis and total joint arthroplasty (TJA) are performed for end stage hallux rigidus.

**Research Question:** The objective of this study is to compare/contrast these two surgical procedures to determine any significant clinical and biomechanical differences.

**Methods:** Kinematic data was collected at our CMAS (Clinical Movement Analysis Society) UK accredited gait laboratory during the gait cycle together with pressure plate pressure readings and a validated patient outcome measure before surgery and at 6 months after surgery.

**Results:** i) There is a \*clinically meaningful difference in the velocity post-op when comparing TJA and arthrodesis in favour of TJA, but this increase in velocity is not statistically significant. There was a statistically significant increased velocity following both these procedures individually from the pre-op condition.

ii) There is a statistically significant reduction in forefoot hindfoot plantar flexion in the sagittal plane at the last 20% of the stance phase of the gait cycle (toe-off) in the arthrodesis group.

iii) There is a statistically significant increase in the 1st metatarsal head peak pressure (MHPP), 1st/5th MHPP ratio and 1st MH pressure time integral (PTI) regardless of type of surgery post-op. There is a clinically significant increase in the medial column pressure and loading only following TJA compared to arthrodesis. (Increased 1st MHPP, increased 1/5 MHPP and increased 1st MHPTI from pre-op to post-op in the TJA group greater than the respective calculated minimal differences calculated, not so in the arthrodesis group).

iv) There is a clinically significant increase in 5th MHPTI following arthrodesis but not following TJA, suggesting increased lateral loading following arthrodesis.

v) There is a statistically significantly improved MOXFQ following both types of surgeries.

**Conclusion:** TJA was found to restore the foot pressures and kinematics towards the normal pressure ratios while arthrodesis results in a compromised gait.

P6

### Evaluation of Tendon-to-Tendon Versus Tendon-to-Bone Transfers in Charcot-Marie-Tooth Foot Surgery

Mr Mohammed Shaath<sup>1</sup>, Miss Ella McCarthy<sup>2</sup>, Mr Gilles Van Eetvelde<sup>1</sup>, Mr Muhammad Chatoo<sup>1</sup>, Mr Shelain Patel<sup>1</sup>, Mr Nick Cullen<sup>1</sup>, Mr Karan Malhotra<sup>1</sup>, Mr Matthew Welck<sup>1</sup>

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**Background:** Charcot-Marie-Tooth (CMT) commonly presents with cavovarus foot deformities. Surgical correction involves bony correction and tendon transfer, usually of the tibialis posterior. Transfer methods include tendon-to-tendon or tendon-to-bone fixation. Although differences between these techniques have been evaluated for footdrop, no previous studies specifically analyse surgery for CMT. Our aim was to compare subjective outcomes and complications between these techniques in CMT feet.

**Methods:** This was a single-centre retrospective series over 10-years. We included patients with CMT undergoing cavovarus foot correction with the following conditions: all had a calcaneal osteotomy, and tibialis posterior tendon transfer. We excluded patients under 18-years and those who had previous surgery. Subjective assessment was done using a questionnaire based on the Stanmore score and using the MOXFQ.

**Results:** 42 feet were included with mean 60-month (12-134-months) follow-up. 31 had tendon-to-bone transfers and 11 had tendon-to-tendon. MOXFQ significantly improved in both groups, but there was no difference in improvement ( $p > 0.05$ ). Patients in their 30s had greater improvement in MOx-FQ-Walking than older patients regardless of procedure ( $p = 0.002$ ). The only subjective differences noted between groups were tendon-to-tendon transfer had better balance ( $p = 0.037$ ), whilst tendon-to-bone required less orthotics ( $p = 0.027$ ). There was no overall significant difference in subjective improvements in power or range-of-movement between groups, or in complications or recurrence rates ( $p > 0.05$ ).

**Conclusions:** We did not demonstrate clinically meaningful differences in outcome between transferring the tibialis posterior to tendon or bone in CMT cavovarus foot correction. Choice of fixation can therefore be at the surgeon's discretion, guided by patient-specific factors.

P7

### The Inaugural United Kingdom National Hallux Valgus Think Tank: Identification of Key Issues and Strategies to Improve Clinical Care for Patient Benefit

Mr Tom Lewis<sup>1</sup>, Mr Abbas See<sup>2</sup>, Dr Linzy Houchen-Wolloff<sup>3</sup>, Mr Jitendra Mangwani<sup>3</sup>,

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**Background:** Hallux valgus (HV) or bunion is a common forefoot deformity impacting pain, function, quality of life, and mobility, with higher prevalence in women and increasing incidence with age. The high prevalence and rates of surgical treatment potentially have a major impact on the healthcare system. The aim of this stakeholder consultation was to identify current issues with provision of HV treatment and identify achievable goals to improve understanding of HV to guide future assessment, treatment pathways, and research directions in order to improve clinical outcomes for patients.

**Methods:** Scoping searches were undertaken to inform and identify relevant outcome sets and existing evidence relating to HV. A one-day think tank conference was held on June 21, 2024, involving stakeholders from various sectors including patients, primary/secondary care professionals, researchers, and representatives of national societies. Key themes and issues related to HV were identified and used to develop structured action development plans.

**Results:** Major issues identified include the absence of national policy recommendations, variability in treatment pathways, and gaps in research and patient education. Patient experiences highlighted the significant impact on quality of life and need for standardised information and care pathways. Key priorities for research include developing a core outcome set and understanding the patient's lived experience, while policy priorities focus on creating national guidelines and raising awareness of the condition's socio-economic and functional impacts.

**Conclusion:** The inaugural UK National Hallux Valgus Think Tank identified critical issues in the management of HV and developed strategies to improve clinical outcomes through research and policy development. Establishing a working group and prioritising both research and policy initiatives will be essential to advancing the understanding and treatment of HV.

P8

### The role of EUA and MRI scans in the evaluation of chronic symptomatic ankle instability- MRI findings of intact ligament doesn't imply functional lateral ligament complex

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**Introduction:** Chronic lateral ankle instability often follows traumatic rupture or pathological laxity of the lateral ankle ligament complex. While MRI is useful in identifying complete ligament tears, it may not reliably detect incompetence in pathologically elongated ligaments. This study aims to determine if EUA is a superior diagnostic tool compared to MRI scans in accurately diagnosing chronic lateral instability.

**Methods:** We conducted a prospective case analysis of 50 symptomatic patients who underwent lateral ligament reconstruction for chronic ankle instability. Each patient underwent both EUA and MRI scans prior to surgery. EUA was performed in the operating theatre under general anaesthesia, using image intensifier guidance to conduct anterior drawer stress and talar tilt tests. MRI scans were independently evaluated by two experienced musculoskeletal radiologists.

**Results:** EUA indicated complete insufficiency of the ankle in 49(98%) patients, as evidenced by positive anterior drawer and talar tilt tests. MRI scans reported complete ligament rupture in 17 patients (34%), thickened ATFL (Anterior Talo-Fibular Ligament) and CFL (Calcaneo-Fibular Ligament) ligaments in 18 patients (36%), and an intact lateral ligament complex in 15 patients (30%) The accuracy of MRI for intact and complete tears of the ATFL and CFL was 76% and 78%, respectively, with sensitivity and specificity of 66% and 84% for intact and 77% and 78% for complete tears, respectively. The sensitivity and specificity for thickening of ATFL and CFL were 75% and 77% respectively.

**Conclusion:** EUA, in conjunction with symptomatic instability, appears more reliable in assessing lateral ligament instability compared to MRI scans. While MRI is valuable for identifying additional pathologies such as osteochondral lesions, peroneal tendon subluxation or tear, and syndesmotic injuries, it is less effective for evaluating hyperlaxity and elongated lateral ligaments. Therefore, EUA should be considered a critical diagnostic tool in managing patients with chronic lateral ankle instability.

P9

### An Audit of Ankle Arthritis Network: Preliminary Nottingham experience and Patient satisfaction.

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**Aim:** The ankle arthritis network is a polyaxial structure designed according to local resources and geography. The aim is to improve the outcome for patients, by facilitating referrals and communication, sharing expertise, supporting peers, minimizing clinical variation. BOFAS has signed off on a set of standards to encourage network development and best practice. The aim of this audit was to assess our network against this standard.

**Methods:** All referrals discussed at NUH regional MDT from August 2023 - 2024 were included. The prospectively collected data was assessed against the pilot BOASt documentation. All outcomes were recorded including network decision, patient surgery, and patient satisfaction.

**Results:** There were 7 hospitals involved in the regional MDT including NUH, which hosted the network meeting monthly over MS teams. 74 cases were discussed; 38 NUH, 8 Kings Mill Hospital, 7 United Lincolnshire Hospital, 5 Royal Chesterfield Hospital, 8, Peterborough City Hospital, 2 Nuffield Orthopaedic Centre Oxford and 6 Royal Derby Hospital. 26 were excluded as did not involve ankle joint sacrificing procedures, leaving 24 cases that involved discussion of complex ankle arthritis and 14 were failing Total Ankle replacements (TARs); of these 10 cases were transferred to NUH and 9 had a revision TAR and 1 a complex primary TAR. The majority of standards were met apart from failure of standardised imaging across network and local follow up for transferred cases. All patients who had their care transferred within the network were satisfied, however those travelling from far preferred their follow up to be arranged locally.

**Discussion:** The Ankle Arthritis network as set by the pilot BOASt document is deliverable with appropriate admin support and clinician engagement. The biggest clinical impact was the transfer of TARs for revision TAR. More work is needed regarding local imaging protocols, local patient follow up and implication's on funding.

P10

### A Retrospective Review of Clinical Outcomes Comparing Unstable Ankle Fractures With and Without a Posterior Malleolus Fracture

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**Background:** The aim of this study was to evaluate the clinical outcomes and complication rates of patients who had sustained an unstable ankle fracture with a posterior malleolus fracture (PMF) and without (N-PMF).

**Methods:** All adult patients presenting to a single large academic trauma centre from 2009-2012 with an unstable ankle fracture requiring surgery were identified. Data collected included patient and injury demographics, fracture classification, posterior malleolus fracture articular surface percentage involvement (ASPI) measured from the lateral plain radiograph, and clinical outcomes. Clinical outcomes included infection rates, re-operation rates and incidence of osteoarthritis post-surgery.

**Results:** There were 1213 patients in the study cohort. Mean age was 47.8 years (16.093.0) and 55.3% (n=671) female. Of the total cohort, 60.2% (n=730) had an associated PMF. These were distributed into ASPI 0-19% (552/730 [75.6%]), 20-33% ASPI (102/730 [14.0%]) and >33% ASPI (76/730 [10.4%]). For all PMFs, 86% (n=628) did not undergo fragment specific fixation. According to ASPI, no specific fixation was used in 98.4% (n=543/552) for ASPI <20%, 67.6% (n=69/102) for ASPI 20-33% and 21.1% (n=16/76) for ASPI >33%. Mean follow up for the study cohort was 1.4 years post injury. There were no statistically significant differences for re-operation (NPMF 20.2% [98/483] vs PMF 22.5% [164/730]; p=0.367) or infection rates (NPMF 5.8% [28/483] vs PMF 6.2% [45/730]; p=0.792). Patients with a PMF were statistically more likely to develop osteoarthritis (NPMF 25.1% [121/483] vs PMF 48.8 % [356/730], p<0.001). Overall, 10/1213 (0.8%) patients required ankle fusion.

**Conclusions:** The presence of a PMF does not affect the overall re-operation and infection rates in patients with a surgically managed unstable ankle fracture with a conservative approach to fixation in a large cohort of patients. The presence of a PMF does increase the risk of post-traumatic osteoarthritis, however, and the effect on patient reported outcome measures remains unclear.

P11

### Reducing the Risk: How Surgeon Expertise Influences Post-Traumatic Osteoarthritis in Ankle Fractures

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Anatomical reduction and restoration of the articular congruity for the trimalleolar ankle fractures are key to avoiding Post-Traumatic Osteoarthritis (PTOA) of the ankle. The literature suggests that these complex injuries should ideally be managed by specialised Foot & Ankle (F&A) surgeons. We aimed to assess the quality of fracture reduction and the association with PTOA in trimalleolar ankle fractures operated on by F&A and General Trauma Surgeons in a UK District General Hospital.

Single-centre Retrospective Cohort study assessing preoperative and post-operative radiographs of trimalleolar ankle fractures between May 2017 and June 2023 with a minimum of one year follow-up. Quality of reduction was determined by assessing articular step-off, measuring the talocrural angle and the incidence of PTOA among patients operated by F&A surgeons and general trauma surgeons. Radiological evaluation was done by 2 independent assessors.

364 patients underwent definitive fixation of trimalleolar fractures, of which, 177 patients (48.6%) were operated on by general trauma surgeons and 187 (51.4%) by F&A surgeons. 54/177 patients from the general trauma surgeons group and 64/187 patients from the F&A group had arthritic changes on follow-up radiographs. 47/54 (87%) from trauma surgeons group who developed PTOA were found to have an intraarticular step off, which was significantly higher than the 38/64 (59%) in the F&A group ( $\bar{x} \pm 2(1) = 6.3$ , p<0.05) and step-off was strongly associated with the development of postoperative arthritis ( $\bar{x} \pm 2(1) = 180.98$ , p<0.001). There was no statistically significant difference between the talocrural angles of F&A (82.41±1.62) and trauma groups (82.21±1.84) (p=0.268); However, Point Biserial Correlation showed a significant association between Talocrural angle and PTOA (rpb=0.25, n=364, p<0.001).

F&A surgeons had improved quality of reduction and lower rates of residual articular step-off and, consequently, significantly lower risks of post-traumatic osteoarthritis in patients with trimalleolar fractures. Talocrural angle had a strong association with the development of PTOA.

P12

### Psychological and functional assessment of Achilles Tendon Ruptures and their return to sports

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**Introduction:** Achilles Tendon Ruptures (ATR) sustained in sport has only previously been investigated in an athletic population. Our aim in this study was to understand the psychology and function of ATR and their return to sport.

**Methods:** A historic cohort study was completed in our specialist Achilles clinic over 3 years in patients who had sustained an ATR when participating in sport in a normal population. Patients completed ATRS (Achilles Tendon Total Rupture Score) and I-PRRS (Injury-Psychological Readiness to Return to Sport).

**Results:** Out of 142 patients with ATR sustained during sport, a total of 73 patients had data available for further analysis beyond 6 months. There were 17 (23.29%) who returned to same sport at the same level, 13 (17.81%) returned to same sport at different level, 11 (15.07%) who returned to different sport and 43.84% who did not return to sport. The I-PRRS and ATRS was significantly lower in the patients who did not return to sport (p <.001 and .003). There was significant correlation between the I-PRRS and ATRS. The most common reason given for not returning to sport was fear of reinjury (41.30%), followed by pain/stiffness (26.09%) and life circumstance (13.04%). Although there was significant correlation between the ATRS and I-PRRS, the patients who did not return to sport at same level and gave reasons for non-return other than due to pain/stiffness, had normal ATRS scores.

**Conclusions:** Return to sport following ATR in a non athletic population was low. The most common reason for failure to return to sport was psychological, however the functional scores and psychological scores displayed significant correlation.

P13

### Fat Transfer for Plantar Heel Pain: A Case Series

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**Background:** Plantar heel pain (PHP) affects 4-7% of the population [1]. It encompasses a range of different pathologies [2]. Heel fat pad atrophy is thought to be the second leading cause of PHP [3]. Atrophy of the heel fat pad leads to decreased cushioning over the calcaneus. The associated pain can be disabling and lead to reduced mobility and social isolation. This case series describes how fat transfer can alleviate symptoms of PHP.

**Methods:** Twenty-one procedures of fat transfer were performed using the Coleman technique [4] for PHP between 2013 and 2023. All surgical candidates had clinical and/or radiological evidence of heel fat pad atrophy and suffered from intractable PHP. Other pathologies, including plantar fasciitis, were excluded prior to surgery. All surgical candidates undertook the Manchester-Oxford Foot Questionnaire (MOXFQ) Patient Reported Outcome Measure prior to surgery and at 3 months postoperatively.

**Results:** The mean preoperative MOXFQ Index score was 71.3 (SD 8.1). The mean postoperative MOXFQ score was 35.9 (SD 15.7). The reduction in mean MOXFQ Index score was 35.9. Paired t-testing revealed a statistically significant reduction in the MOXFQ index score ( $p < 0.0001$ ). There were no cases of reoperation. There were no recorded postoperative complications.

**Conclusions:** This case series study highlights the potential efficacy of autologous surgical fat transfer in alleviating intractable PHP associated with heel fat pad atrophy. This case series is limited by its small sample size and long study window. Despite initial and promising results, further research evaluating a larger cohort is warranted.

P14

### Comparative Biomechanical Study of Different Screw Fixation Methods For Minimally Invasive Hallux Valgus Surgery: A Finite Element Analysis

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**Background:** There are different screw configurations utilised for minimally invasive hallux valgus (HV) deformity despite limited biomechanical data assessing the stability and strength of each construct. We aimed to compare the strength of various screw configurations for minimally invasive HV surgery using finite element analysis (FEA).

**Methods:** A FEA model was developed from a CT of a female with moderate HV deformity. Five screw configurations utilizing one or two bicortical or intramedullary screws were tested. Stress analysis considered osteotomy displacement, maximum and minimum principal stresses, and von Mises stress for both implants and bone for each screw configuration.

**Results:** Fixation with two screws (one bicortical and one intramedullary) demonstrated the lowest values for osteotomy displacement, minimum and maximum total stress, and equivalent von Mises stress on the bone and screws in both loading conditions.

**Conclusion:** The optimal configuration when performing minimally invasive surgery for moderate HV is one bicortical and one intramedullary screw.

P15

### A Retrospective 10-year Review of Patient Reported Outcome Measures Comparing Unstable Ankle Fractures With and Without a Posterior Malleolus Fracture

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**Background:** The aim of this study was to evaluate the long-term outcomes of patients who had sustained an unstable ankle fracture with a posterior malleolus fracture (PMF) and without (N-PMF).

**Methods:** Adult patients presenting to a single large academic trauma centre from 2009-2012 with an unstable ankle fracture requiring surgery were identified. Data collected included patient demographics, fracture classification, posterior malleolus fracture articular surface percentage involvement (ASPI) measured from the lateral plain radiograph, and management. Patient reported outcome measures (PROMs) were obtained at a minimum of 10 years post-surgery. The primary outcome was the Olerud Molander Ankle Score (OMAS). Secondary outcomes were Manchester-Oxford Foot Questionnaire (MOXFQ), EuroQoL-5D, infection and re-operation rate.

**Results:** There were 304 patients in the study cohort. Mean age was 49.6 years (16.378.3) and 67% (n=204) female. Of these, 67% (n=204) had a PMF. These were distributed into an ASPI 0-19% (156/204 [76.5%]), 20-33% ASPI (27/204 [13.2%]) and >33% ASPI (21/204 [10.3%]). Overall, 10% of these (22/204) were managed with fragment specific fixation (1/22 ASPI<20%, 6/22 ASPI-20-33%, 15/22 ASPI>33%). At a mean of 13.8 years (11.3 - 15.3) the median OMAS score was 85 (IQR 60 -100). There was no difference in the OMAS between the N-PMF and PMF groups (85 [IQR 56.25 - 100] vs 85 [IQR 61.25 - 100];  $p = 0.580$ ). No statistical differences were found in the MOXFQ ( $p=0.643$ ), EQ-5D ( $p = 0.720$ ) and EQ-5D-VAS ( $p=0.224$ ). There were no differences between the N-PMF and PMF groups for infection (6% vs 4%;  $p=0.417$ ) or re-operation rates (4% vs 2%;  $p=0.297$ ).

**Conclusions:** The presence of a PMF does not affect the long-term patient reported outcomes in patients with a surgically managed unstable ankle fracture, along with comparable infection and re-operation rates. These findings are in the context of selective fixation of PMFs, with only 1 in 10 patients undergoing fixation.

P16

### Infection following foot and ankle surgery: Further analysis of data captured from the UK FATE Audit

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**Background:** The UK Foot and Ankle Thromboembolism (UK FATE) Collaborative's primary aim was to evaluate incidence of venous thromboembolism (VTE), however it also recorded other complications, including infection rate within 90 days. (1) We therefore aimed to evaluate overall rate of superficial and deep infection following foot and ankle surgery; whether this differed between trauma, elective and acute diabetic surgery; and patient and operative factors affecting infection.

**Methods:** Data were collected prospectively across 68 centres UK-wide for all patients who underwent foot and ankle surgery, or treatment of Achilles tendon ruptures, between 1st June to 30th November 2022. Data collected included development of superficial and deep infection within 90 days of procedure and presence of co-morbidities.

**Results:** A total of 9,723 patients were available for analysis. Overall superficial and deep infection rates in trauma, elective and acute diabetic procedures were 4.14% (n=397/9591) and 1.39% (n=133/9591), respectively. Superficial infections were highest in acute diabetic procedures (7.44% (n=29/361)) compared to trauma (3.87% (n=171/4245)) and elective (4.12% (n=197/4588)). Observed deep infection differed between trauma (1.47% (n=65/4351)), elective (0.71% (n=34/4785)) and acute diabetic (8.72% (n=34/356)) procedures. On multi-regressions analysis ASA grade III-IV ( $p=.01$ , OR 1.89), current smoker ( $p<0.001$ , OR 2.46), diabetes ( $p<.001$ , OR 3.06), peripheral vascular disease ( $p<0001$ , OR 3.33) and taking chemical prophylaxis ( $p=0.028$ , OR 1.60) were independent predictors of infection.

**Conclusions:** The rate of superficial and deep infections were significantly higher in patients with acute diabetic foot surgery. Deep infection rates were higher in trauma than in elective surgery, but superficial infection rates were similar. Co-morbidities and smoking affect infection rate in foot and ankle surgery and should be considered both pre-operatively and in post-operative monitoring. This data represents infection within 90 days of procedure; however evaluation of long-term outcomes will provide further insight.

## P17

### Accessing the Posterior Malleolus: The posterolateral or medial posteromedial approach?

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**Introduction:** The posterolateral (PL) approach to the ankle remains to be commonly used for accessing the posterior malleolus (PM) despite its limitations which include inadequate exposure of the fracture as well as increased risk to peroneal artery. REF As such, the medial posteromedial (MPM) approach has been developed and described to address these two issues. REF The aim of this study is to compare the complications of the two approaches.

**Methods:** A historic cohort study all operatively treated ankle fractures between August 2022 and March 2024 was undertaken. Comorbidities, injury details, fracture morphology, operative details, clinical and radiographic follow-up were recorded. Complication were classification in line with the modified Clavien-Dindo grading for foot and ankle surgery.[1]

**Results:** 427 operatively treated ankle fractures were screened, 92 (21.55%) involved surgically treated PMFs. Of these, the MPM approach was used in 68 cases (73.91%), while the PL approach was used in 12 cases (13.19%). Of the 68 MPM approaches, 10 (14.71%) patients developed postoperative complications (Grade 1A: 3, Grade 1B: 1, Grade 2A: 3, Grade 2B: 1, Grade 3A:1, Grade 3B:1). Of the 12 PL approaches, 8 (66.67%) patients developed postoperative complications (Grade 1B: 1, Grade 2A: 4, Grade 2B: 1, Grade 3A: 1, Grade 3B: 1).

**Conclusions:** In this study, the MPM approach to the ankle was associated with fewer and less severe postoperative complications compared to the PL approach. The MPM approach has greater utility in exposing the posterior tibia and is possibly safer than the PL approach.

## P18

### Clinical Results of Bio-Integrative Fiber-Reinforced Implants for Hammertoe Correction: A Review of Surgical Outcomes

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**Introduction:** Hammertoe deformity, which constitutes nearly half of all forefoot surgeries, has traditionally been corrected using Kirschner wire (K-wire) fixation. However, K-wires are associated with various complications. Intramedullary implants offer better pain control, higher union rates, and lower infection risks. OSSIOfiber implants, made from reinforcing mineral fibers and a bioabsorbable polymer matrix, are a novel alternative. This study evaluates the radiological and clinical outcomes of OSSIOfiber implants for hammertoe correction.

**Methods:** A retrospective cohort study was conducted at a large urban academic medical center from January 2022 to December 2023. Patients with hammertoe deformities who underwent surgery using OSSIOfiber implants were assessed. Clinical outcomes were measured using the Patient-Reported Outcomes Measurement Information System (PROMIS), and radiographic imaging was used to evaluate union rates. Data on patient characteristics and postoperative complications were collected.

**Results:** The study included 11 patients with 21 operative toes, with a mean follow-up of 5.7 months. Deformity correction was maintained clinically and radiologically in 81% of toes. Significant improvements were noted in PROMIS domains: Physical Function, Pain Interference, and Pain Intensity. The successful union rate was 81%. However, the complication rate was 52.3%, with 19% requiring re-intervention due to painful malunion or non-union, and 23.8% of cases converting to K-wire fixation.

**Conclusion:** The OSSIOfiber implant showed promising clinical and radiological outcomes for hammertoe correction. Despite its effectiveness, the high complication rate and need for potential conversion to K-wire fixation emphasize the importance of pre-operative planning. Further long-term studies are needed to confirm its reliability as an alternative for joint fusion in lesser toes.

## P19

### Sagittal alignment following ankle and tibiototalcalcaneal arthrodesis: A retrospective review of radiological and patient reported outcomes

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**Aims:** This study aimed to examine the relationship between sagittal plane alignment and patient-reported outcomes measures (PROMs) in patients undergoing ankle / tibiototalcalcaneal (TTC) arthrodesis.

**Methods:** Single-centre, retrospective review of patients undergoing ankle or TTC arthrodesis over an 8-year period. Measurements were performed on WBCT images: anterior/medial distal tibial angles (aDTA / mDTA), coronal talar tilt, and sagittal tibial-sole angle (TSA), tibio-talar angle (TTA), and tibio-calcaneal inclination angles (TCA). These were obtained from 50 normal patients and 42 patients undergoing fusions pre-operatively and at 3 and 12 months postoperatively. MOXFQ scores were collected pre- and post-operatively and post-operative subjective alignment was recorded.

**Results:** Mean age was 56±12.9 years and BMI was 30.5±5.1 kg/m<sup>2</sup>. Ankle arthrodesis was performed in 35/42 (83.3%) patients. Pre-operative deformity was >10 degrees from normal in sagittal/coronal plane in 8 patients (19%) and moderate (±5 degrees) in 8 patients (19%). There was no difference between normal group and post-operative group TSA (p=0.058), although there was a lower (more dorsiflexed) TTA (5.0 degrees, p<0.001) and TCA (2.9 degrees, p=0.037) in post-operative scans. There was no difference in sagittal post-operative position by type of fixation, ankle/TTC, arthroscopic/open or degree of pre-operative deformity. Significant improvements were observed in all MOXFQ domains (p<0.01). Age / BMI / final position did not influence PROMs. On regression analysis, a lower TSA was the only factor predictive for a subjective feeling of a dorsiflexed foot (p=0.021, Exp(B)=0.472).

**Conclusions:** Regardless of pre-operative deformity, Ankle/TTC arthrodesis is effective at restoring sagittal alignment and improves PROMs. Although there is some variation in TTA, TCA may compensate partially for this resulting in a balanced foot (TSA). TSA influenced perceptions of sagittal balance, particularly when dorsiflexed. It is important to strive for optimal sagittal alignment in ankle and TTC arthrodesis, which may be judged intra-operatively by the TSA.

## P20

### Hallux Valgus surgery and 1st MTPJ fusion Outcomes from the BOFAS Registry.

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**Introduction:** Utilising the BOFAS registry to examine hallux valgus surgery and 1st MTPJ fusion has the advantage of providing large volume data with favourable external validity relating to these common conditions.

**Methods:** BOFAS registry patients undergoing hallux valgus (HV) surgery (excluding tarsometatarsal fusion and isolated Akin osteotomy) and 1st MTP joint fusion surgery were identified.

**Results:** There were 1000 cases of HV surgery and 1508 cases of 1st MTPJ fusion surgery. Both groups had significant functional impairment (MOXFQ/VAS) at baseline. Whilst 1st MTPJ fusion patients had significantly (p<0.001) higher baseline scores for all MOXFQ parameters compared to the HV cohort, only the walking component of MOXFQ was greater than the MCID [1, 2].

13.80% of patients in the HV group and 12.60% of patients in the 1st MTPJ fusion group had complete data to allow comparison of PROM score difference between baseline and 12 months. Of these patients both cohorts demonstrated a statistical and clinically significant improvement at 12 months in all components MOXFQ/VAS scores. Whilst at 12 months the MOXFQ/VAS scores remained significantly higher in the 1st MTPJ fusion cohort than the HV cohort this did not reach the MCID in any component.

Comparing the improvements in MOXFQ/VAS there was a greater improvement in scores from baseline to 12 months in the 1st MTPJ fusion group, however this was not statistically significant.

**Conclusion:** This data demonstrates hallux valgus leads to functional impairment similar to 1st MTP osteoarthritis; the MOXFQ walking component was the only domain in which 1st MTPJ fusion patients had clinically (MCID) worse baseline symptoms.

Acknowledging the limitations of our low follow-up rates, our data demonstrates both types of surgery lead to clinically significant improvements in patient function. Furthermore offering 1st MTPJ fusion does not lead to a clinically worse outcome (MCID) than hallux valgus surgery.