World Congress Foot and Ankle 2017

Pre-Congress:
EFAS Advanced Symposium 28th September 2017

6th Triennial IFFAS Scientific Meeting

29th-30th September 2017
Lisbon, Portugal

Final Programme



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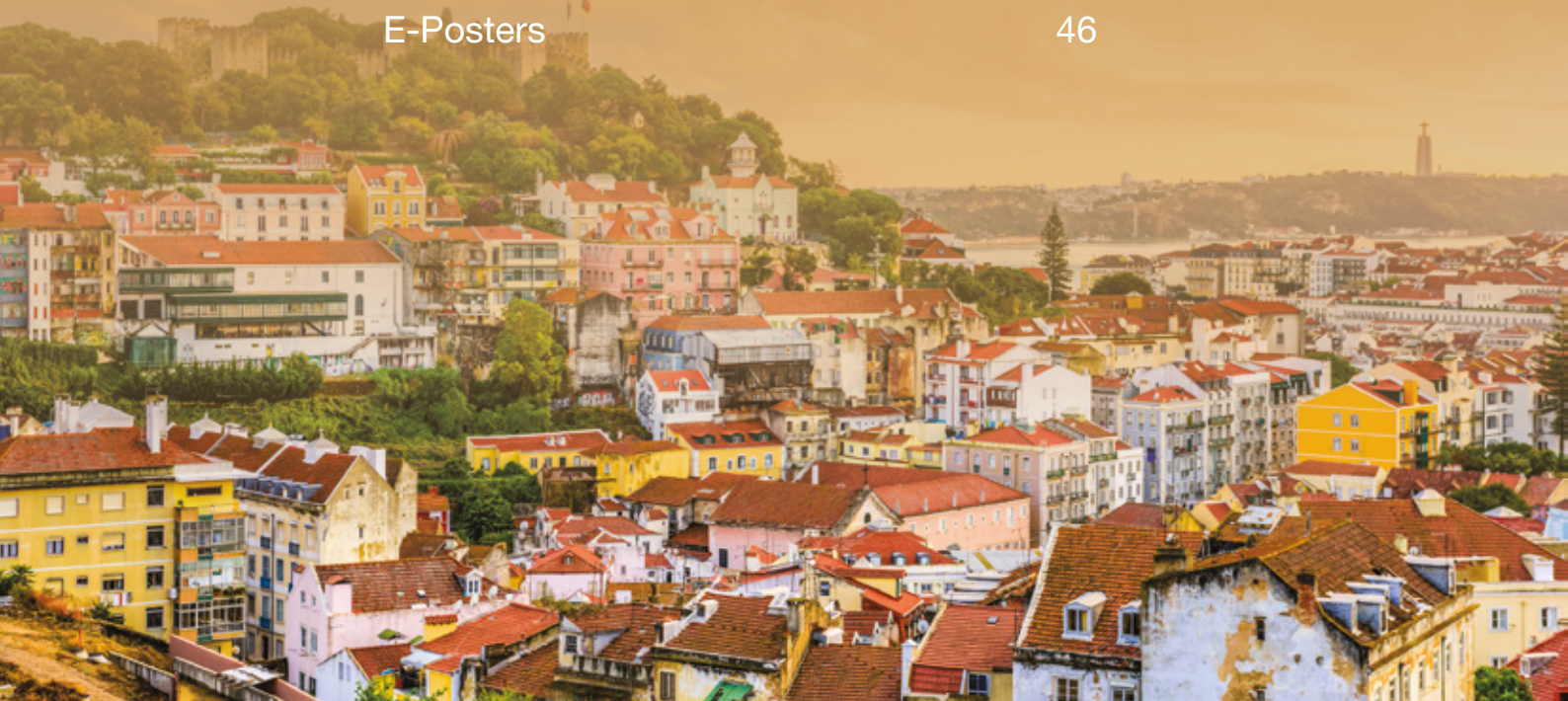


Welcome

International Federation of Foot & Ankle Societies

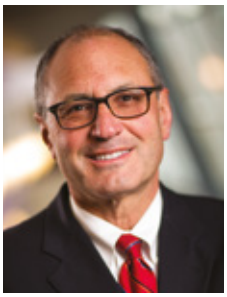
Dear Colleagues,

Welcome to the **6th Triennial Scientific Meeting of the International Federation of Foot & Ankle Societies!** Be prepared to learn, connect, and explore new ideas with colleagues old and new. This meeting is a special opportunity for orthopaedic foot and ankle professionals from around the world to come together to exchange ideas and focus on important clinical and research topics in our field. The IFFAS Council and our beautiful host city of Lisbon extend a warm welcome to you.

A record number of abstracts were submitted for this meeting, and the strong registration for this global meeting speak to the interest and abundance of talent and expertise within our specialty and its member organizations. The planning committees have organized an exceptional program featuring 80 podium papers, a dozen symposia with international expert faculty from the four federations of IFFAS, and a large number of E-Posters.
The IFFAS' prestigious awards will be presented in recognition of the best clinical paper, best research paper, and the best poster.

We are grateful to the members of the IFFAS Scientific Committee and the Symposia Committee for their contributions and the host/sponsoring federation – the European Foot and Ankle Society – for its administration of the meeting.

Welcome to Lisbon, and learn, connect, and explore all that our specialty has to offer.



Charles L. Saltzman, MD
IFFAS President

Martinus Richter, MD, PhD
IFFAS Vice President/Program Chair

Congress Host

International Federation of Foot & Ankle Societies

IFFAS

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Congress Organisers and Local Host

EFAS

General E-mail: Efasevents@mci-group.com
Website: www.efas.co

IFFAS Council

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Martinus Richter, MD, PhD (Germany), Vice President
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Antonio Viladot, MD (Spain)

Mark Your Calendar!

7th IFFAS Triennial Scientific Meeting

April 23-25, 2020

Vina del Mar, Chile

Hosted by the Latin American Federation of Medicine and Surgery of the Foot and Leg (FLAMECIPP)

Programme Schedule

	MORNING	AFTERNOON	EVENING
WEDNESDAY 27.09.17	Exhibition Set Up	Exhibition Set Up	
THURSDAY 28.09.17	MORNING	AFTERNOON	EVENING
	6th EFAS Advanced Symposium Difficult Scenarios and Controversies	6th EFAS Advanced Symposium Difficult Scenarios and Controversies	**Congress Welcome Reception** **18:30** Patio de Gale
FRIDAY 29.09.17	MORNING	AFTERNOON	EVENING
	08:00-10:00 Session 1 and 2 Auditorium I: **Joint Preserving Strategies (Non-Ankle)** Auditorium II: **Obtaining & Maintaining a Stable Syndesmosis** *Morning Coffee Break, Exhibition & E-Posters* **10:30-12:30 Session 3 and 4** Auditorium I: **Plantar Plate Repair or Not** Auditorium II: **Ankle Fusion or TAR**	**12:30-13:45** *Lunch, Exhibition, E-Posters & Workshops* **13:45-15:45 Session 5** Auditorium I: **CENTRAL SESSION Forefoot – Minimally Invasive or Not** *Afternoon Coffee Break, Exhibition & E-Posters* **16:15-18:00 Session 6 and 7** Auditorium I: **Diabetes/Charcot** Auditorium II: **Trauma**	**Congress Gala Dinner** **20:00** Palacio de Xabregas
SATURDAY 30.09.17	MORNING	AFTERNOON	EVENING
	08:00-10:00 Session 8 and 9 Auditorium I: **Sports Arthroscopy** Auditorium II: **What is new in Foot and Ankle** *Morning Coffee Break, Exhibition & Posters* **10:30-12:30 Session 10 and 11** Auditorium I: **Tendon-Ligament** Auditorium II: **Cartilage Repair**	**12:30-13:45** *Lunch, Exhibition, Posters & Workshops* **13:45-15:45 Session 12** Auditorium I : **CENTRAL SESSION: Ankle – Joint Preserving Measures** Presentation: **IFFAS Awards and President Inauguration** *Afternoon Coffee Break, Exhibition & Posters* **16:15-18:00 Session 13 and 14** Auditorium I: **Free Papers** Auditorium II: **Free Papers** **18:00** Close and Depart	

IFFAS Awards

Best Clinical Paper: The Takakura Prize

Polymorphisms of estrogen receptors in menopausal women with posterior tibial tendon dysfunction

P. A. Pontin, C. de Cesar Netto, F. Fonseca, E. C. Baracat, K. Carvalho, T. Fernandes, A. Godoy Santos

The Takakura Prize is awarded for the Best Clinical Paper selected by the Scientific Committee. It consists of a glass award and a monetary award. The prize is named in honor of and given by IFFAS founder Yoshinori Takakura, MD.

Best Research Paper: The Saltzman Prize

Antinociceptive effect of hyaluronic acid sodium on ankle osteoarthritis model

S. Jimbo, Y.Terashima, A. Teramoto, K. Watanabe, Y. Sakakibara, H. Shoji, , N. Tohse, Y. Yamashita

The President's Prize or Saltzman Prize is awarded for the Best Research Paper selected by the Scientific Committee. It consists of a glass award and a monetary award and is named in honor of the current president for the IFFAS Triennial Scientific Meeting.

Best Poster

Osteochondral autologous transplantation versus dorsal closing wedge metatarsal osteotomy for the treatment of Freiberg's infraction in athletic population

D. Georgiannos, I. Bisbinas

The Best Poster is selected by the Scientific Committee. The award consists of a certificate and a monetary award.

Thursday 28th September 2017

EFAS Advanced Symposium

PROGRAMME

08.00-08:30	Registration
08:30-08:40	Welcome: M. Delmi, EFAS President and D. Singh, Chair EFAS Scientific Committee
08:40-10:15	**SESSION 1: PRIMARY ADULT ACQUIRED FLAT FOOT DEFORMITY**
	Moderators: *D. Singh and M. Delmi*
	Scenario: **A 65 year old active female (BMI 30) with stage 2B tibialis posterior insufficiency, severe forefoot abduction, sagittal laxity at naviculo-cuneiform level and hallux valgus**
	08:40-08:45 Scenario presentation, *D. Singh*
	08:45-08:53 A calcaneal osteotomy is mandatory, *F. Krause*
	08:53-09:01 At what point is a lateral column lengthening obligatory?, *W.C. Lee*
	09:01-09:09 What is the role of spring ligament reconstruction in this case?, *J.L. Besse*
	09:09-09:17 This patient needs a medial column procedure (Cotton Osteotomy/Lapidus), *C. Saltzman*
	09:17-09:25 This patient needs an arthroreisis screw – My approach, *A. Viladot*
	09:25-09:33 The threshold to fuse? How does BMI affect decision making in this case?, *A. Witteveen*
	09:33-10:15 Discussion
10:15-10:45	*Coffee Break and Exhibition*
10:45-12:15	**SESSION 2: WHAT WOULD YOU DO IN THIS SCENARIO?**
	Moderators: *D. Redfern and A. Viladot*
	10:45-10:53 Flat foot with severe tarso-metatarsal arthritis, *D. Singh*
	10:53-11:01 Flat foot associated with a tarsal coalition, *J. Hamel*
	11:01-11:09 Recurrent arch collapse after flatfoot reconstruction, *A. Witteveen*
	11:09-11:17 Persistent flat foot/valgus heel after triple arthodesis, *B. Sangeorzan*
	11:17-11:25 Paradoxical flatfoot varus; Müller-Weiss Disease, *M. Monteagudo*
	11:25-11:33 Double or Triple Arthrodesis, *F. Alvarez*
	11:33-12:15 Discussion
	12:15-13:15 **EFAS ANNUAL GENERAL ASSEMBLY**
13.15-14:30	*Lunch, Exhibition & Industry Workshops (Workshops start at 13:40-14:20)*
14:30-16:00	**SESSION 3: INFECTIVE SCENARIOS**
	Moderators: *J. L. Besse and F. Vannini*
	Case 1: A 70 year old woman, open ankle fracture 2004. Left TAR, 5wks post-op pain, redness superficial seepage, no fever, c-protein and leukocytes normal
	14:30-14:35 Case presentation, *J.L. Besse*
	14.35-14:42 I would retain the implants (My algorithm for infected TAR), *N. Corte-Real*
	14:42-14:49 This needs revision (My algorithm for infected TAR), *X. Martin Oliva*
	14:49- 15:10 Discussion
	Case 2: A 70 year old diabetic presents with Charcot foot (Eichenholtz III), Rocker bottom deformity, lateral plantar ulcer (10 months)
	15:10-15:15 Case presentation, *F. Vannini*
	15:15-15:22 How I would investigate?, *V. Valderrabano*
	15:22-15:29 The role and limitations of non-operative treatment *C. Walker*
	15:29-15:36 My preferred approach - External fixation in this scenario, *F. Robinson*
	15:36-15:43 My preferred approach - Staged fusion is the best option, *V. Kavarthapu*
	15.43-16.10 Discussion
16.10-16.40	*Coffee Break and Exhibition*
16.40-17.55	**SESSION 4: THE EFAS LISBON CLINIC Cases have been submitted by delegates in advance of this session**
	Moderators: *M. Richter and V. Valderrabano*
	Panel: *D. Redfern, C. Saltzman, A. Viladot, V. Valderrabano, M. Delmi, J.L. Besse, B. Sangeorzan, W.C. Lee*
	18.30 **OPENING WELCOME RECEPTION IFFAS TRIENNIAL MEETING**
	Patio de Gale, Lisbon (Coach Transfers from 18:00)

IFFAS Invited Faculty *(Speakers)*

FORENAME	SURNAME	ORGANISATION
Louis Samuel	Barouk	EFAS
Daniel	Baumfeld	FLAMECIPP
Judith	Baumhauer	NAFFAS
Doug	Beaman	NAFFAS
Giovanni	Carcuro	FLAMECIPP
Sofia	Carlucci	FLAMECIPP
Marina	Carrasco	FLAMECIPP
W. Hodges	Davis	NAFFAS
Christopher	DiGiovanni	NAFFAS
Eric	Giza	NAFFAS
Mark	Glazebrook	NAFFAS
Marta	Gomes	EFAS
Santiago	Guerrero	FLAMECIPP
Gregory	Guyton	NAFFAS
Beat	Hintermann	EFAS
Jeffrey	Johnson	NAFFAS
Gabriel	Khazen	FLAMECIPP
Hakon	Kofoed	EFAS
Tsukasa	Kumai	AFFAS
Keun Bae	Lee	AFFAS
Woo Chun	Lee	AFFAS
Jin Woo	Lee	AFFAS
Xavier	Martin Oliva	EFAS
Donald J.	McBride	EFAS
Jeremy	McCormick	NAFFAS
Thomas	Mittlmeier	EFAS
Caio	Nery	FLAMECIPP
Hisateru	Niki	AFFAS
Ryuzo	Okuda	AFFAS
Cristian	Ortiz	FLAMECIPP
Satoru	Ozeki	AFFAS
Andri	Primadhi	AFFAS
Stefan	Rammelt	EFAS
Marcos	Sakaki	FLAMECIPP
Bruce	Sangeorzan	NAFFAS
Anthony	Sakellariou	EFAS
Rajesh	Simon	AFFAS
Pablo	Sotelano	FLAMECIPP
Masato	Takao	AFFAS
Yasuhito	Tanaka	AFFAS
Hans-Jorg	Trnka	EFAS
Victor	Valderrabano	EFAS
Jordi Vega	Vega	EFAS
Antonio	Volpe	EFAS
Emilio	Wagner	FLAMECIPP
Ian	Winson	EFAS
Xu	Xy	AFFAS
Alastair	Younger	NAFFAS

IFFAS Invited Faculty *(Moderators)*

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Alexej	Barg	NAFFAS
Joao	De Carvalho Neto	EFAS
Marino	Delmi	EFAS
Mark	Easley	NAFFAS
Andre	Gomes	EFAS
Beat	Hintermann	EFAS
Kjetil	Hvaal	EFAS
Gabriel	Khazen	FLAMECIPP
Hakon	Kofoed	EFAS
Jin Woo	Lee	AFFAS
Woo Chun	Lee	AFFAS
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Manuel	Monteagudo	EFAS
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Antonio	Viladot	EFAS
Ian	Winson	EFAS
Henry	Yip	AFFAS
Alastair	Younger	NAFFAS

KEY

AFFAS	Asian Federation of Foot and Ankle Surgeons
EFAS	European Foot and Ankle Society
FLAMECIPP	Latin American Federation of Medicine and Surgery of the Foot and Leg
NAFFAS	North American Federation of Foot & Ankle Societies

29th and 30th September 2017

6TH IFFAS TRIENNIAL MEETING
PROGRAMME

FRIDAY 29 September 2017

07:15	Registration	
07:50	Opening Ceremony	ROOM: Auditorium I
	C. Saltzman, M. Richter	

Session 1 • 08:00 - 10:00 — ROOM: Auditorium I

JOINT PRESERVING STRATEGIES (NON ANKLE)

Moderators: *C. Ortiz, M. Easley*

08:00 - 08:12	Joint preserving surgery in severe forefoot disorders	*L.S. Barouk*
08:12 - 08:24	Malunited Lisfranc Injuries; Joint sparing treatments to keep it functional	*D. Baumfeld*
08:24 - 08:36	Long-term outcome of joint-preserving surgery by combination metatarsal osteotomies for shortening (CMOS) for forefoot deformity in patients with rheumatoid arthritis	*H. Niki*
08:36 - 08:48	Current strategies of Joint Preserving Surgeries for Great Toe Arthritis: The Options and the Evidence	*J. Baumhauer*
08:48 - 09.16	Discussion	
09:16 - 09:22	Development of a cadaveric Hallux Rigidus model. Biomechanical testing	*D. Zanolli*
09:22 - 09:28	Forefoot surgery in depressed patients: To operate or not to operate?	*J. Amestoy*
09:28 - 09:34	A Comparative Study of Modified Mitchells and Scarf Osteotomies for Moderate Hallux Valgus	*B. Lau*
09:34 - 09:40	The Use of 3D Prints to Compare the Efficacy of Different Calcaneal Osteotomies for Heel Varus	*G. Pfeffer*
09:40 - 10:00	Discussion	

Session 2 • 08:00 - 10:00 — ROOM: Auditorium II

OBTAINING AND MAINTAINING A STABLE SYNDESMOSIS

Moderators: *A. Viladot, H. Yip*

08:00 - 08:12	Intraoperative techniques of assessing the anatomic reduction of the fibula and posterior fragment	*T. Mittlmeier*
08:12 - 08:24	Strategies to obtain syndesmosis reduction in acute trauma	*M. Sakaki*
08:24 - 08:36	Is Open reduction for Syndesmotic injury an optimal treatment?	*R. Simon*
08:36 - 08:48	Arthroscopic Evaluation of Subtle Syndesmotic Instability	*G. Guyton*
08:48 - 09.16	Discussion	
09:16 - 09:22	Weightbearing Versus Gravity Stress Radiographs For Stability Evaluation of SER Fractures Of The Ankle	*A. Seidel*
09:22 - 09:28	Chronic syndesmotic injuries; Treatment and evolution	*S. Catalán Amigo*
09:28 - 09:34	Histomorphometrical changes in cartilage, synovial cells and synovial fluid after ankle fracture	*A.L. Godoy Santos*
09:34 - 09:40	Abnormal Gutter Geometry as a Risk Factor of Chronic Ankle Instability	*Y. Tochigi*
09:40 - 09:46	Morphology of the incisura fibularis at the distal tibiofibular syndesmosis in the Japanese population	*I. Tonogai*
09:46 - 10:00	Discussion	

10:00 – 10:30 Coffee Break, Exhibition and E-Posters

Session 3 • 10:30 - 12:30 ROOM: Auditorium I

PLANTAR PLATE- REPAIR OR NOT

Moderators: *M. Monteagudo, I. Rosa*

10:30 - 10:42	The evolution of my algorithm to the plantar plate problem	*H.J. Trnka*
10:42 - 10:54	The Plantar Plate Repair: A significant step ahead to re-establish the balance of the lesser MTP joints	*C. Nery*
10:54 - 11:06	Open reduction and ligament reconstruction for complete or incomplete dislocation of the lesser metatarsophalangeal joint with hallux valgus	*R. Okuda*
11:06 - 11:18	Surgical strategies, pearls and pitfalls for the plantar plate injuries	*C. Saltzman*
11:18 - 11:45	Discussion	
11:45 - 11:51	Does the first metatarsal bone twist itself in hallux valgus? -Investigations with CT scans	*K. Maruyama*
11:51 - 11:57	Comparison between two techniques in hammertoe surgery after 5 years	*P. Ceccarini*
11:57 - 11:03	Gait and Footprint Analysis in Patients with Hallux Valgus	*N. Ito*
11:03 - 11:09	A Novel Method to Evaluate Microvasculature of the Plantar Plate: Does the Biology Support Repair?	*F. Finney*
11:09 - 12:15	The results of scarf osteotomy without implant stabilization	*H. Liszka*
12:15 - 12:30	Discussion	

Session 4 • 10:30 - 12:30 ROOM: Auditorium II

ANKLE FUSION OR TAR

Moderators: *C. Saltzman, H. Kofoed*

10:30 - 10:42	Ankle arthrodesis or Arthroplasty: Either way it is all about the Forces	*D.J. McBride*
10:42 - 10:54	Ankle Arthrodesis versus TAR	*M. Carrasco*
10:54 - 11:06	Managing complications and osteolysis	*K.B. Lee*
11:06 - 11:18	Comparing effectiveness of ankle arthrodesis and ankle replacement using patient self –reported outcomes and wearable technology	*B. Sangeorzan*
11:18 - 11:45	Discussion	
11:45 - 11:51	Revision surgery using ceramic talar prosthesis for total ankle arthroplasty	*R. Katsui*
11:51 - 11:57	Comparison of Intermediate to Long-Term Outcomes of Total Ankle Arthroplasty in Varus and Valgus Alignment Compared with Neutral Alignment	*K.B. Lee*
11:57 - 12:03	The effect of deformity and hindfoot arthritis on mid-term outcomes of ankle replacement and fusion	*M. Penner*
12:03 - 12:09	MR Imaging of Ankle Arthroplasty Implants: Findings of Normal and Symptomatic Patients	*C. de Cesar Netto*
12:09 - 12:15	Contact Stresses in a Fixed-Bearing Total Ankle Replacement: A Finite Element Analysis	*N. Martinelli*
12:15 - 12:30	Discussion	

12:30 – 13:45 Lunch, Exhibition, Workshops and E-Posters

Session 5 • 13:45 - 15:45 Central Session ROOM: Auditorium I

FOREFOOT: MINIMALLY INVASIVE OR NOT

Moderators: *M. Delmi, J. W. Lee*

13:45 - 13:57	Shortening chevron osteotomy for treatment of hallux rigidus	*M. Gomes*
13:57 - 14:09	First Metatarsophalangeal Arthrodesis using endomedullary screw fixation. Open or percutaneus	*S. Carlucci*
14:09 - 14:21	Hallux Valgus Minimal Invasive or Not	*X. Xy*
14:21 - 14:33	Big surgery for big forefoot deformities: it's not about the incision but the result	*W.H. Davis*
14:33 - 15:00	Discussion	
15:00 - 15:06	Comparison Between Proximal Chevron and Distal Chevron Osteotomy in Moderate to Severe Hallux Valgus Patients Undergoing Simultaneous Bilateral Correction	*G.W. Lee*
15:06 - 15:12	Comparison of the outcomes between two osteotomies for second metatarsophalangeal joint dislocation	*T. Kokubo*
15:12 - 15:18	Minimally invasive distal linear metatarsal osteotomy for treatment of hallux valgus	*T. Hagio*

15:18 - 15:24	Percutaneuous Distal Osteotomy (Pdo) For Recurrent Hallux Valgus	*B. Magnan*
15:24 - 15:30	Minimally invasive chevron osteotomy vs open chevron for hallux valgus correction: midterm results	*G. Kaufmann*
15:30 - 15:45	Discussion	

15:45 – 16:15 Coffee Break, Exhibition, E-Posters

Session 6 • 16:15 - 18:00

ROOM: Auditorium I

DIABETES/CHARCOT

Moderators: *K. Hvaal, Y. Tanaka*

16:15 - 16:27	Surgical treatment of Charcot deformities with external frame	*A. Volpe*
16:27 - 16:39	Midfoot Charcot Fixation; What do I prefer	*G. Khazen*
16:39 - 16:51	Tendon Contracture as The Determinant of Outcome in the Treatment of Diabetic Foot Problems	*A. Primadhi*
16:51 - 17:03	Management of the Diabetic/Neuropathic Patient with an Ankle Fracture	*J. Johnson*
17:03 - 17.15	Discussion	
17:15 - 17:21	The Critical Role of Synovium in Charcot Neuroarthropathy	*Z. Zhang*
17:21 - 17:27	The effects of multiple risk factors on the functional outcomes after the Broström procedure	*E.H. Shin*
17:27 - 17:33	Radiographic results of percutaneous procedures for severe hallux valgus deformities	*T. Kurashige*
17:33 - 17:39	Mobile- vs. Fixed-Bearing Total Ankle Prostheses: A Systematic Review and Meta-Analysis	*A. Barg*
17:39 - 17:45	First metatarsophalangeal arthrodesis- are post-operative true lateral x-rays necessary?	*T. Hossain*
17:45 - 18:00	Discussion	

Session 7 • 16:15 - 18:00

ROOM: Auditorium II

TRAUMA

Moderators: *B. Sangeorzan, G. Carcuro*

16:15 - 16:27	Fractures of the posterior malleolus – old dogmas and new concepts?	*S. Rammelt*
16:27 - 16:39	Isolated Lateral Malleolous Ankle Fractures: what is stable and what is not?	*A. Sakellariou*
16:39 - 16:51	Treatment for the residual deformities in foot injuries	*S. Ozeki*
16:51 - 17:03	Lisfranc Injuries: what should we be doing?	*C. DiGiovanni*
17:03 - 17.15	Discussion	
17:15 - 17:21	Conservative treatment Versus Repair Deltoid in SER Type IV Equivalent Ankle Fracture: A Prospective Study	*C. Rungprai*
17:21 - 17:27	Peroneal tendon tears: 50% rule, a myth? Biomechanical cadaveric evaluation	*E. Wagner*
17:27 - 17:33	Primary arthrodesis compared with open reduction and internal fixation for Lisfranc injuries with the first tarsometatarsal joint dislocation	*M. Zhang*
17:33 - 17:39	Sinus tarsi approach vs. extensile lateral approach for intra-articular calcaneal fracture	*M. Khongphaophong*
17:39 - 17:45	Influence of local drainage on calcaneal fractures; surgical treatment complications	*J. Figueiredo*
17:45 - 18:00	Discussion	

20:00 Congress Gala Dinner Palacio de Xabregas

SATURDAY 30 September 2017

Session 8 • 08:00 - 10:00

ROOM: Auditorium I

SPORTS - ARTHROSCOPY

Moderators: *C. Nery, F. Lintz*

08:00 - 08:12	Treatment of the posterior ankle impingement by arthroscopy, Anatomic Study and surgical techniques	*X. Martin Oliva*
08:12 - 08:24	Foot and ankle endoscopy indications and limits	*C. Ortiz*
08:24 - 08:36	Arthroscopic repair/reconstruction for lateral instability of the ankle	*M. Takao*
08:36 - 08:48	Arthroscopic Treatment of Talus Osteochondral Defects	*E. Giza*
08:48 - 09.16	Discussion	
09:16 - 09:22	Effect of Initial Graft Tension at Calcaneofibular Ligament Reconstruction for Ankle Stability	*Y. Sakakibara*
09:22 - 09:28	Safe Zone for the Plantar Portal: A Cadaveric Study	*S. Maeda*
09:28 - 09:34	Simultaneous Reconstruction of the Medial and Lateral Collateral Ligaments of the Ankle	*T. Yasuda*
09:34 - 09:40	Influence of learning curve of Achilles tendon rupture repair for surgical complications and no influence on Patient related complications	*A. Makulavicius*
09:40 - 09:46	Combination of PedCAT with Pedography Shows Relationship of Foot Center and Center of Gravity	*M. Richter*
09:45 - 10:00	Discussion	

Session 9 • 08:00 - 10:00

ROOM: Auditorium II

WHAT'S NEW IN FOOT AND ANKLE

Moderators: *A. Gomes, A. Barg*

08:00 - 08:12	Need for new concepts in joint implant surgery	*H. Kofoed*
08:12 - 08:24	Treatment of Chronic deltoid ligament insufficiency, our option: repair with Internal Brace™ augmentation	*G. Carcuro*
08:24 - 08:36	New practical applications of artificial total talar prosthesis	*Y. Tanaka*
08:36 - 08:48	What's new in Ankle Arthritis Outcomes: Lessons learned from a Canadian Outcomes Database	*A. Younger*
08:48 - 09.16	Discussion	
09:16 - 09:22	Oxford Foot Model and weight bearing CT (pedCAT): Comparison of tibia-hindfoot angle and arch height	*M.R. Wachowsky*
09:22 - 09:28	The influence of a calcaneal medial steotomy on hindfoot alignment using a pre-and post-operative weightbearing CT	*A. Burssens*
09:28 - 09:34	Flatfoot Hindfoot Alignment : A Comparison of Clinical Assessment and Weightbearing ConeBeam CT	*C. de Cesar Netto*
09:34 - 09:40	Analysis of Articular Surface Motion at the Ankle and Subtalar Joints Using Distance Mapping	*S. Siegler*
09:40 - 09:46	Weightbearing CT in normal hindfoot alignment; Presence of a constitutional valgus?	*A. Burssens*
09:45 - 10:00	Discussion	

10:00 – 10:30 Coffee Break, Exhibition and E-Posters

Session 10 • 10:30 - 12:30

ROOM: Auditorium I

TENDON-LIGAMENT

Moderators: *M. Penner, W.C. Lee*

10:30 - 10:42	Peroneal tendons pathology in ankle instability. An endoscopic point of view	*J. Vega*
10:42 - 10:54	State of the art in deltoid ligament injuries	*H.J. Masaragian*
10:54 - 11:06	Insertional Achilles tendinopathy – two different pathologies and the possibility for non-operative treatments	*T. Kumai*
11:06 - 11:18	Evolution to MIS for Ankle Stabilization: A comprehensive international approach using the principals of Anatomy, Biomechanics and Evidence Based Medicine	*M. Glazebrook*
11:18 - 11:45	Discussion	
11:45 - 11:51	Tenogenic differentiation of tonsil and bone marrow-derived mesenchymal stem cells	*S.Y. Lee*
11:51 - 11:57	Optimization of Tenocyte Lineage-Related Factors from Tonsil-Derived Mesenchymal Stem Cells using Design of Experiments	*S-S. Kwon*

11:57 - 12:03	Biomechanical comparison of circumtibial and transmembranous posterior tibial tendon transfer	*P. Wagner*
12:03 - 12:09	Achilles tendinopathy induced by serial injections of collagenase: a new experimental model	*C. de Cesar Netto*
12:09 - 12:15	Therapeutic potential of Mesenchymal Stem Cells to treat Achilles Tendon Injuries	*M.H. Costa Vieira*
12:15 - 12:30	Discussion	

Session 11 • 10:30 - 12:30

ROOM: Auditorium II

CARTILAGE REPAIR

Moderators: *B. Hintermann, Y.Takakura*

10:30 - 10:42	Osteochondral lesion of talus: What is the problem & solution?	*J.W.Lee*
10:42 - 10:54	Microfractire for osteochondral lesion of the talus-is it still the gold standard for treatment	*J. McCormick*
10:54 - 11:06	Osteochondral lesions treated with cancellous bone grafting and periosteal flap. My experience	*S. Guerrero*
11:06 - 11:18	AMIC surgery for osteochondral Lesions of the Talus	*V. Valderrabano*
11:18 - 11:45	Discussion	
11:45 - 11:51	Anatomic feature of deltoid ligament attachment in posteromedial osteochondral lesion of talar dome	*T. Nakasa*
11:51 - 11:57	Matrix-Associated Stem Cell Transplantation (MAST) in Chondral Defects of the Ankle is Safe and Effective	*M. Richter*
11:57 - 12:03	Primary versus Secondary Osteochondral Autograft Transplantation in Patients with Large Sized OLTs	*K.H. Park*
12:03 - 12:09	Magnetic Resonance T1rho Mapping of Articular Cartilage Grafts After Autologous Osteochondral Transplantation for Osteochondral Lesions of the Talus: A Longitudinal Evaluation	*N. Haraguchi*
12:09 - 12:15	Evaluation of reproducibility of the Magnetic Resonance Observation of Cartilage Repair Tissue (MOCART)	*A. Bianchi*
12:15 - 12:30	Discussion	

12:30 – 13:45 Lunch, Exhibition, Workshops & E-Posters

Session 12 • 13:45 - 15:45 Central Session

ROOM: Auditorium I

AWARDS CEREMONY

13:45 - 13:55	IFFAS Awards Ceremony	
13:55 - 14:00	Inauguration of New IFFAS President	

ANKLE-JOINT PRESERVING MEASURES

Moderators: *M. Richter, C. Saltzman*

14:00 - 14:12	Osteotomies around the ankle, principles and planning	*E. Wagner*
14:12 - 14:24	Effect of Osteotomies around the Ankle	*B. Hintermann*
14:24 - 14:36	Ankle Joint Preserving Measures	*W.C. Lee*
14:36 - 14:48	Ankle Distraction: How to succeed	*D. Beaman*
14:48 - 15:10	Discussion	
15:10 - 15:16	Antinociceptive effect of hyaluronic acid sodium on ankle osteoarthritis model **Best Research Paper: The Saltzman Prize**	*S. Jimbo*
15:16 - 15:22	Preoperative Patient-reported Outcome Measures Predict Success in Patients with Ankle Arthritis	*A. Younger*
15:22 - 15:28	Relationship between Isokinetic Muscle Strength and Functional Test in Chronic Ankle Instability	*Y. H. Park*
15:28 - 15:34	Weight-bearing CT analysis of chronic lateral ankle instability: a multivariate study of 124 feet	*F. Lintz*
15:34 - 15:40	Weight-bearing Computed Tomography Findings in Varus Ankle Osteoarthritis: Abnormal Internal Rotation of the Talus in Axial Plane	*M.H. Kim*
15:40 - 15:50	Discussion	

15:50 - 16:15 Coffee, Exhibition, E-Posters

Session 13 • 16:15 - 17:30

ROOM: Auditorium I

FREE PAPERS

Moderators: *J. C. Neto, A. Younger*

16:15 - 16:21	Polymorphisms of estrogen receptors in menopausal women with posterior tibial tendon dysfunction **Best Clinical Paper: The Takakura Prize**	*P.A. Pontin*
16:21 - 16:27	Conservative Treatment for Plantar Fasciitis: A Prospective Randomized Study among Three Methods	*C. Jasmin*
16:27 - 16:33	Randomized control study of toe exercise for prevention from fall in elderly people	*K. Amaha*
16:33 - 16:39	Novel concept for preserving severe valgus ankle osteoarthritis with large talar tilt: Realignment of the foot with triple arthrodesis	*W.C. Lee*
16:39 - 16:45	Which surgical treatment is better for plantar fasciitis? A randomized controlled trial	*C. Gamba*
16:45 - 16:51	Minimal important change, measurement error and responsiveness for the SEFAS	*M. Cöster*
16:51 - 16:57	Defining Gastrocnemius Tightness-A study on 400 participants without foot and ankle pathology	*O. Chan*
16:57 - 17:03	Changes in the ankle joint and hindfoot alignment following varus deformity correction of the knee	*B.O. Jeong*
17:03 - 17:09	Evaluation of rotation of first metatarsus with hallux valgus by computed tomography	*Y. Nakamoto*
17:09 - 17:15	Intramedullary plate fixation in hallux valgus	*S. Kamil Cepni*
17:15 - 17:30	Discussion	

Session 14 • 16:15 - 17:30

ROOM: Auditorium II

FREE PAPERS

Moderators: *J. Nunley II, S. Rammelt*

16:15 - 16:21	Phenol Injection for Morton's Neuroma Under Elettroneurographic Guidance	*B. Magnan*
16:21 - 16:27	Repeatability of a multi-segment foot model with a 15-marker set in healthy children	*E.J. Kim*
16:27 - 16:33	Translation, cultural adaptation and validation of the Foot Function Index-revised (FFI-R)	*K. Stéfani*
16:33 - 16:39	Efficacy of dermal fenestration technique on soft tissues in distal tibia and fibula fractures	*U. Akgun*
16:39 - 16:45	Minimum 10-19 Years; Follow-Up of the Star Total Ankle Perform in the USA	*J. Nunley II*
16:45 - 16:51	Deltoid ligament injury patterns in external rotation ankle injuries, a cadaveric study	*M. Cooper*
16:51 - 16:57	Clinical Outcome for Total Ankle Replacement in Patients Younger Than 50 Years	*D. Spuehler*
16:57 - 17:03	Medializing Calcaneal Osteotomy (MCO) For Acquired Adult Flatfoot	*E. Samaila*
17:03 - 17:09	Percentage of articular surface debridement is equivalent in arthroscopic and open ankle fusions	*M. Anderson*
17:09 - 17: 15	Revision Rate of Total Ankle Replacement in Patients Younger Than 50 Years	*N. Zullig*
17:15 - 17:30	Discussion	

CLOSING CEREMONY

ROOM: Auditorium I

Moderators: *C. Saltzman, M. Richter*

17:30 Awards Ceremony, Closing and Farewell

Host City and Congress Venue

Lisbon, Portugal

Lisbon is one of the oldest cities in the world, and the oldest in Western Europe, predating other modern European capitals such as London, Paris and Rome by centuries. A cosmopolitan capital with a Mediterranean climate, Lisbon offers vast cultural experiences to visitors, and it is a city is also proud to maintain its traditions. Lisbon City has a rich history dating back to the Roman Empire. Julius Caesar himself made it a Municipium. It has several historical sites with the Belem Tower and the Jeronimos Monastery being declared World Heritage Sites by **UNESCO**. The venue for the congress is located close to the point in **Belem at The Discoveries Monument** where Vasco da Gama embarked on his voyage from Portugal to India in 1497, and it was here too that Christopher Columbus anchored on his way back to Spain following his historic discovery of the Americas. This city of discoveries is the perfect host for the World Congress: Foot and Ankle 2017.

Congress Venue:

Lisboa Congress Centre
Praça das Indústrias
1300-307 Lisboa

The Centro de Congressos de Lisboa is located near the Tagus river close to the historic buildings of Belém quarter.

Transfer from Hotels to Congress Venue

A coach transfer will operate from and to the Congress Hotels: Marriott Lisbon Hotel and EPIC Sana Hotels. Please refer to the transfer timetable which will be available in the Hotel Reception on arrival.

With the support of Turismo de Lisboa

Networking Events

Thursday 28th September
18:30- 19:30 WELCOME RECEPTION

Venue: Pátio de Galé, Lisbon

Meet colleagues and friends at a Welcome Reception hosted under the beautiful and historic Pombaline arcades of Patio de Gale on the western side of Lisbon's celebrated 18th Century Comercio Square. Drinks and Canapés will be served.

A coach transfer will operate from the Congress Centre to the Welcome Reception Venue (meeting point in the Congress Centre lobby level 0 at 18.00). A coach transfer will operate from and to the Congress Hotels: Marriott Lisbon Hotel and EPIC Sana Hotels to the Welcome Reception Venue. Please refer to the transfer timetable which will be available in the Hotel Reception on arrival.

This is a ticketed event with participation listing booked as part of the online registration process. No tickets can be issued onsite. Coaches depart Lisbon Congress Centre and Marriott Lisbon Hotel. Please refer to shuttle schedule for timings. There is no return coach transfer.

Friday 29th September
20:00 – 23:00 CONGRESS DINNER

Venue: Palacio de Xabregas

Join together for a special evening at the Palace of Xabregas located to the east of Lisbon. Built by the famous Portuguese sailor and aristocrat Tristão da Cunha at the end of the 16th Century, the Palace of Xabregas was the **official residence of the Portuguese Royal family**, and was one of a few buildings that survived the earthquake of 1755, which destroyed the rest of the city. The walls of the Palace are adorned with paintings and artwork and the Palace has one of the **largest private collections of tiles in Portugal**.

A coach transfer will operate from and to the Congress Hotels: Marriott Lisbon Hotel. Please refer to the transfer timetable which will be available in the Hotel Reception on arrival.

This is a ticketed event with participation listing booked as part of the online registration process. Limited tickets may be available onsite. Check at the Registration Desk. Coaches depart Marriott Lisbon and Epic Sana Hotel. Please refer to schedule for timings. Tickets: €90 per person to include entrance to Palacio Xabregas, Cocktail Reception, 3-Course Dinner and Wines by exclusive Penha Longa Catering, Entertainment and Return Coach Transport Marriott Congress Hotel and Epic Sana Hotel.

General Congress Information

ABSTRACTS The Keynote abstracts are included in this programme. Free Paper and E-Poster abstracts are available for a limited time to view on the Foot and Ankle Surgery Online Supplement using the access link sent to each participant by email.

ACCREDITATION 6th EFAS Advanced Symposium is granted 5 ECMEC and 6th Triennial IFFAS Meeting is granted 14 ECMEC by the European Accreditation Council for Continuing Medical Education (EACCME). Participants will receive details to download their Certificate of Attendance after the meetings.

CANCELLATION There is no refund for onsite cancellations, hotel no-shows or early cancellation/departure from the congress hotels.

E-POSTERS E-Posters can be viewed using the E-Poster Terminals in the Exhibition areas. The E-Posters are listed at the back of this programme.

EXHIBITION & SPONSORSHIP The Exhibition is open during the opening hours of the meetings in Pavilions 4 and 5. Industry are hosting workshops during the lunch breaks. Participants can enjoy Coffee and Buffet lunch which will be served in the Exhibition area.

INSURANCE Registration Fees do not include insurance. Insurance is the individual responsibility of each participant.

LANGUAGE The meetings Language is English. There is no translation service.

REGISTRATION **The Onsite Registration Desk will be open as follows;**

Wednesday 27th September	16:00-18:00
Thursday 28th September	08:00-18:00
Friday 29th September	07:15-18:00
Saturday 30th September	07:30-17:45

SUBMISSION OF PRESENTATIONS AND SPEAKER PREVIEW AREA Presentations (in Microsoft PowerPoint) should be brought to the Meeting on USB/memory stick. Presentations must be checked in and previewed at the Speaker Preview Room at the latest 3 hours before your scheduled presentation. Speakers are not permitted to use their own laptops for presentation in the auditorium. All presenters must go to the Speakers Preview Area, Room 9, located between Exhibition Hall 4 and 5. If you are presenting more than one abstract during the Congress, you may upload all your presentations at the same time and they will be displayed in the relevant session rooms at the correct time.

The **Opening Hours of the Speaker Preview Room and Service** are as follows:

Wednesday 27th September	16:00-18:00
Thursday 28th and Friday 29th September	07:00-18:00
Saturday 30th September	07:00-17:30

WIFI FREE Wifi is available in Lisbon congress centre.

Network Name: IFFAS 2017
Password: EFASIFFAS17

Tour Programme Options

Thursday 28th September 2017
HALF DAY WALKING TOUR LISBON (09:00 -13:00)

Includes English Speaking Guide, transport to centre and Coffee with local pastry. Tours will depart from Marriott Lisbon Hotel at 09:00.

Cost: €35 per person

Friday 29th September 2017
FULL DAY TOUR LISBON; Alfama, Castle and Belem Quarter (09:00 -17:30)

Includes English Speaking Guide, transport, Coffee with local pastry, 3 course Lunch in Restaurant Old Town, all Entrance fees. Tours will depart from Marriott Lisbon Hotel at 09:00.

Cost: €110 per person

Saturday 30th September 2017
HALF DAY TOUR SINTRA; Sintra and Pena Palace (09:00 -13:00)

Includes English Speaking Guide, transport, visit Pena Palace and Coffee with local pastry. Tours will depart from Marriott Lisbon Hotel at 09:00.

Cost: €50 per person

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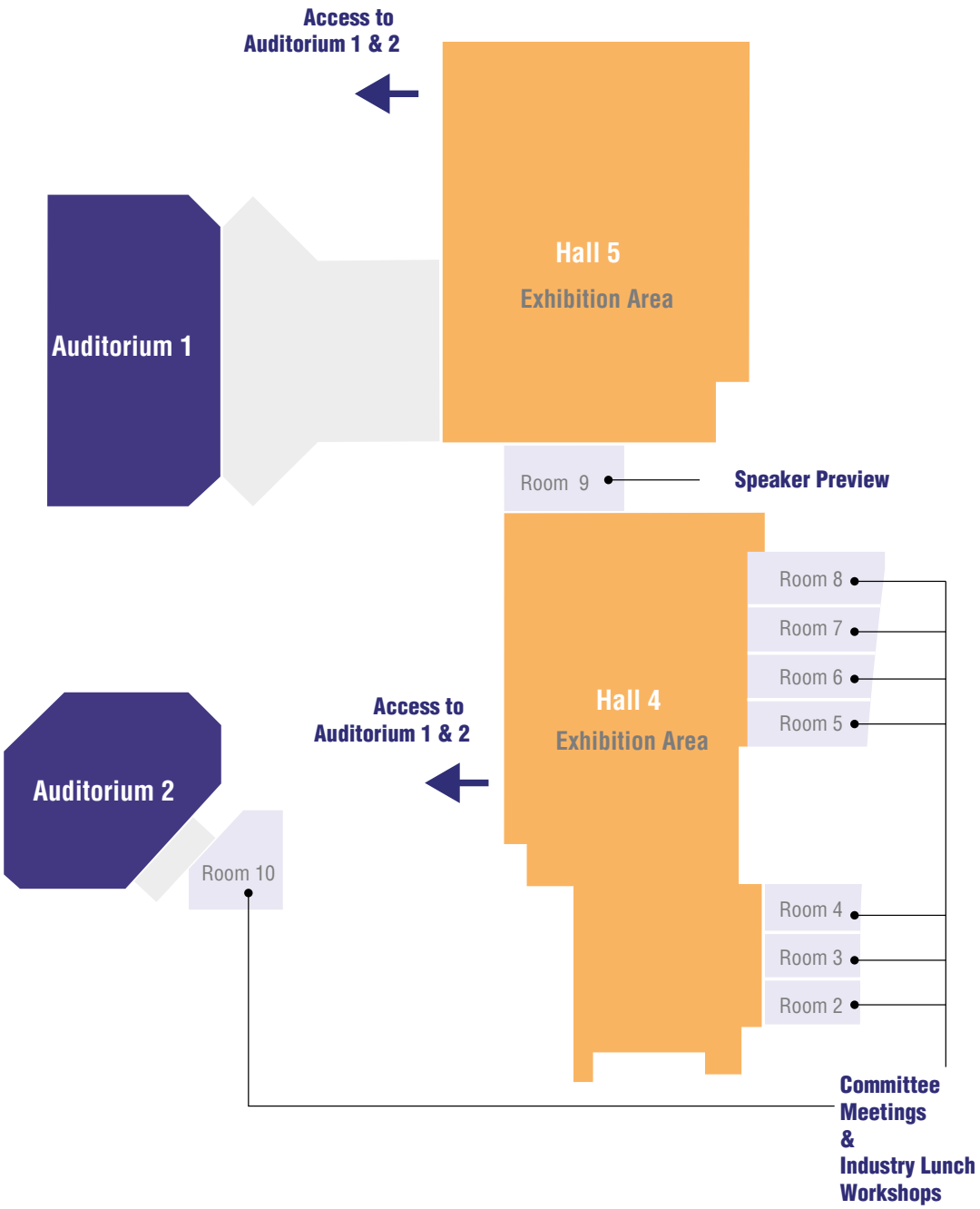
Venue Plan

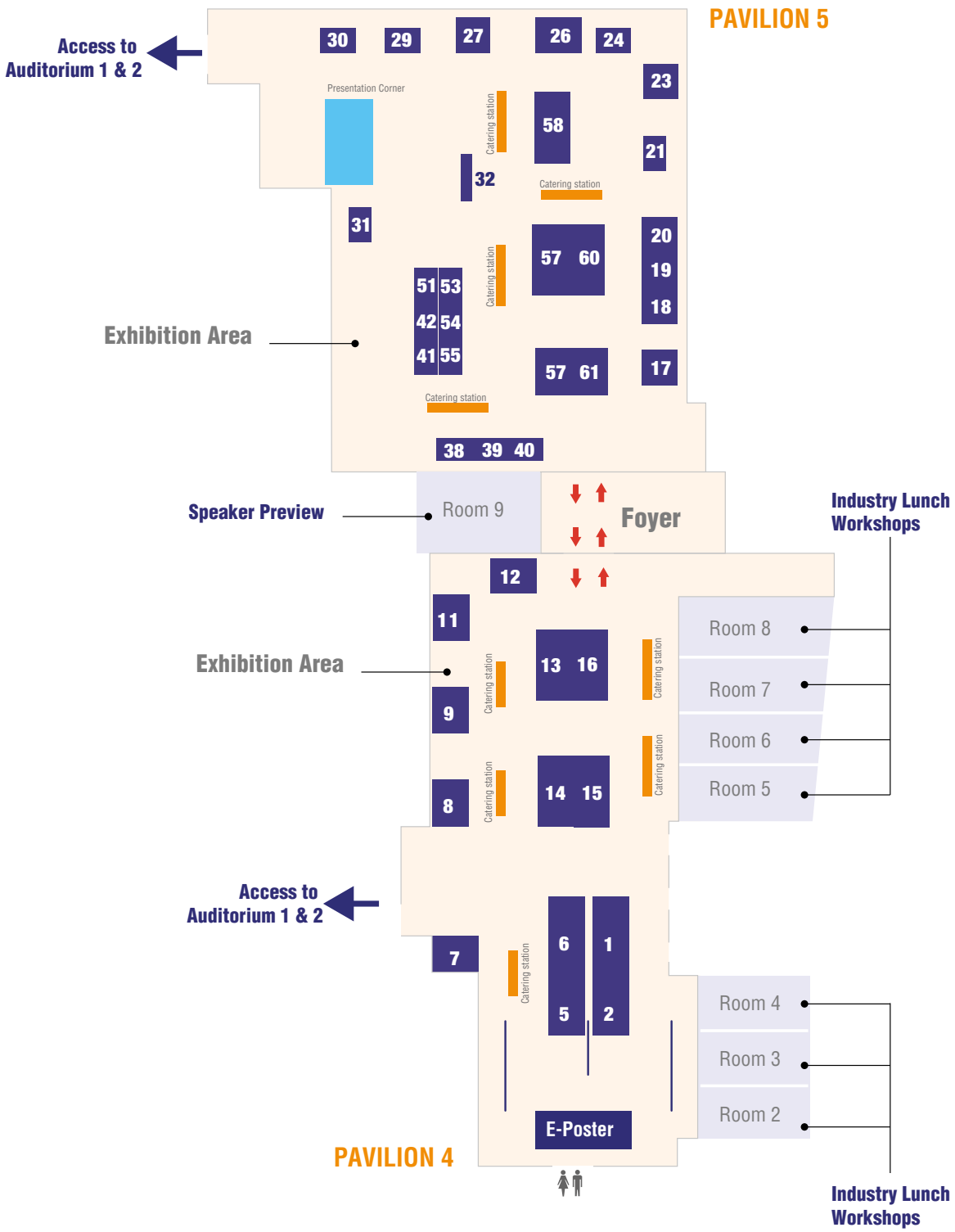

Access to
Auditorium 1 & 2
Hall 5
Exhibition Area
Auditorium 1
Room 9
Speaker Preview
Room 8
Room 7
Room 6
Room 5
Hall 4
Exhibition Area
Access to
Auditorium 1 & 2
Auditorium 2
Room 10
Room 4
Room 3
Room 2
Committee
Meetings
&
Industry Lunch
Workshops

Industry

Exhibition Plan

First Level
Pavilion 4&5

The EFAS /IFFAS meetings Exhibition is located in Halls 4 and 5 adjacent to Auditorium I and II. The Exhibition is open on Thursday 28th, Friday 29th and Saturday 30th September (3 days). View the Exhibition Plan Posters to see the location of each stand.



Exhibition Stands

SPACE NO	COMPANY NAME (Alpha)
1	DePuy Synthes
2	DT MedTech International Limited
5	Acumed
6	Zimmer Biomet
7	Geistlich Pharma
8	Integra
9	Gramedica
11	Extremity Medical
12	Paragon 28
13	In2Bones
14	Stryker
15	Wright
16	Medartis
17	Osteomed
18	Curvebeam
19	Changzhou Waston Medical Appliances Company
20	Exactech
21	Smith & Nephew Orthopaedics
23	EFAS Foundation
24	Bookseller

SPACE NO	COMPANY NAME (Alpha)
26	PLANMED
27	Novastep
29	Astrolabe
30	Orthosolutions UK
31	Orthoscoot
38	GMREIS
39	Scaffdex
40	Intercus
41	Shanghai Bojin Electric Inst
42	American Orthopaedic Foot & Ankle Society
51	Naton Medical Group
53	Neosteo
54	Alphanorm Medizintechnik
55	Novel
56	Hologic
57	Newclip Technics
58	Arthrex
60	Carestream Health Spain
61	FH Orthopaedics

Industry Lunch Workshops

Industry have arranged update events outside the core scientific meeting hours. Please note that EFAS and IFFAS have no responsibility for the content and attendance is entirely at the discretion of participants. Please check with the industry stand for the programme for each workshop.

Thursday 28th September 13:40-14:20

WORKSHOP ROOM 4: NEWCLIP

Title: **New plating system developments in Foot Surgery**

- Presenter: *V. Dubois Ferrière*
  The single-use solution for 1st MTP arthrodesis
- Presenter: *P. Amado*
  Dynamic step plate, what is the difference in the calcaneus osteotomy

WORKSHOP ROOM 5:

Title: **PIP Fusion Implants: New Materials – Why change?**
Presenter: *D. Boublil*

WORKSHOP ROOM 6:

Title: **Cadence® Total Ankle System: Introducing the Next Step in the Advancement of Ankle Arthroplasty**
Presenters: *T. Daniels, S. Parekh*

WORKSHOP ROOM 7:

Title: **A Heritage of Healing: Acutrak Technology for Headless Compression Screws**
Presenter: *TBC*

WORKSHOP ROOM 8:

Title: **Swiss Solutions for Foot & Ankle Surgery**
Presenters: *E. Orthner, C. Plaass, V. Valderrabano*

Friday 29th September 12:50-13:30

WORKSHOP ROOM 3:

Title: **Role of Biomaterials in the Treatment of Osteochondral Lesions in the Ankle Joint**

- Presenter: *M. Walther*
  5-year data on the mini-open AMIC® Chondro-Gide® technique
- Presenter: *M. Richter*
  5-year data on the Matrix-Associated Stem cell Transplantation (MAST) technique with Chondro-Gide® in the ankle

WORKSHOP ROOM 4:

Title: **Extremilock Ankle Fusion Plating System**
Presenter: *E.J. Bailey*

Friday 29th September (continued) 12:50-13:30

DePuy Synthes

WORKSHOP ROOM 5:

Title: **Innovative Solutions: From Hammertoe to Complex Diabetic Foot**

- Presenter: *C. Coetzee*
  Continuous Compression Implants in Foot and Ankle Surgery
- Presenter: *J.M. Rios Ruh*
  Management of Complex Diabetic Foot

Paragon 28

WORKSHOP ROOM 6:

Title: **Proximal rotational metatarsal osteotomy, PROMO and the Lapidus Nail**

Presenters: *E. Wagner and P. Wagner*

Arthrex

WORKSHOP ROOM 7:

Title 1: **Internal Brace – security for the lateral ankle repair**

Presenter: *B. Ribbans*

Title 2: **Achilles Midsubstance tears – Percutaneous knotless repair**

Presenter: *M. de Sousa*

Title 3: **Lisfranc Ligament Repair**

Presenter: *N. Brito*

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WORKSHOP ROOM 8

Title: **Swiss Solutions for Foot & Ankle Surgery**

Presenters: *L. Drittenbass, C. Plaass, V. Valderrabano*

Saturday 30th September 12:50-13:30

CurveBeam

WORKSHOP ROOM 8:

Title: **PedCAT – the new standard in radiographic imaging in foot and ankle surgery**

Presenters: *M. Richter, F. Lintz*
Moderator: *C. de Cesar Neto*

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Other Industry Update Events

Dynamic Presentation Corner Thursday — 28th September

The Dynamic Presentation Corner situated in the Exhibition Hall.
Visit the Stryker stand No. 14 for more information.

Dynamic Presentation Corner Friday — 29th September

Join Depuy Synthes staff and International Faculty for hands-on demonstrations of the latest innovations at the Dynamic Presentation Corner.

The Dynamic Presentation Corner situated in the Exhibition Hall.
Visit the Depuy Stand No. 1 for more information.

Mobile Laboratory Truck — Thursday 28th, Friday 29th, Saturday 30th September

Laboratory Truck will be located at the front of the Lisbon Congress Centre building.
Visit the Wright Stand No. 15 for information.

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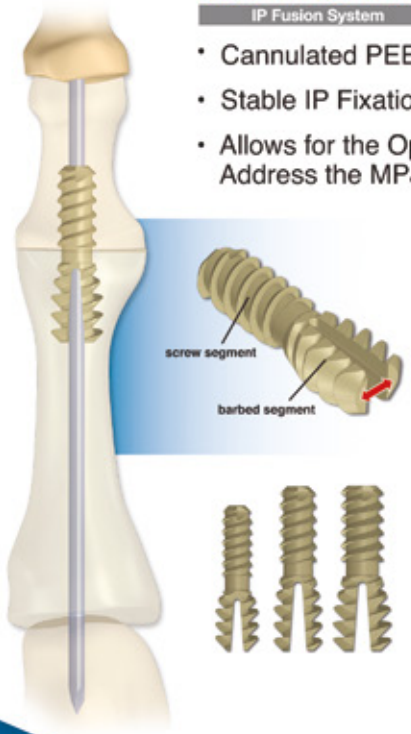

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World Congress Foot and Ankle 2017

6th Triennial IFFAS Scientific Meeting

29th-30th September 2017

Lisbon, Portugal

Keynote Abstracts

In order of presentation in the programme

Session I- Joint Preserving Strategies (Non Ankle)

My experience of joint preserving surgery in forefoot severe Disorders

L.S. Barouk

Bordeaux, France

We call severe disorders of the forefoot the following deformities: very advanced Hallux valgus deformity severe Metatarsalgia, MTP lesser rays dislocation, severe iatrogenic disorders, and severe rheumatoid forefoot. They were our indications of surgical correction. Our purpose was to replace the traditional first MTP fusion and lateral metatarsal heads resection by a joint preserving surgery.

During the 15 last years of my forefoot surgical exercise, the correction of these severe disorders represented 28% of my practice. On a AOFAS meeting in 2003, I reported results of 566 severe forefoot disorders operated from 1991 to 2003. On the whole I had corrected almost 800 cases until 2005, when I stopped to make surgery.

Technique: On the first ray, Scarf with shortening and great toe first phalanx osteotomies. On the lateral rays Weil osteotomy. The Harmonized Shortening of the metatarsals was the common feature, based on the **ms** point, which is radiographically located on the most impaired or deformed ray, on the most proximal point of the proximal phalanx. This provides the required longitudinal decompression. At least 3 rays must be included in the correction, but generally the whole forefoot is involved. First MTP fusion is reduced to 4%of cases, lesser metatarsal head resection 5%, and this may be combined with joint preserving on the same foot. The poor quality of the bones required a heel support shoe during four to six post op. weeks.

Results. Post-operative period with minimal swelling or pain. A complete correction was observed in 91% of cases, with similarly functional recovery. Results are particularly significant in rheumatoid forefoot correction. This results are maintained on the long term (follow.up maxim 20 years)

Complications: Recurrency of hallux valgus 4% of cases, MTP lesser metatarsal recurrent dislocation 4% of cases, metatarsalgia not corrected 5% of cases. Post-operative secondary retreat of the metatarsal heads after Weil Osteotomy in case of too much impaired heads. (5%).The rate of stiffness after the Weil Osteotomies is significantly reduced (6%), due to the large required shortening. Neverthess for any complication,a complementary revision surgery was successful in almost all cases.

In conclusion, thanks to the harmonized and large shortening of the metatarsals based on the **ms** point, which provides the necessary longitudinal decompression, the correction of forefoot severe deformities, whatever their origin, is regularly obtained with almost all MTP joint preserving, and this is effective in most of cases, avoiding MTP fusion or resection, This preserving surgery enter to the current of the new evolution of foot surgery.

10 years F.up

Session I- Joint Preserving Strategies (Non Ankle)

Malunited Lisfranc Injuries: Joint sparing treatments to keep it functional

D. Baumfeld

UFMG- Federal University of Minas Gerais, Belo Horizonte, Brazil

An asymmetric midfoot with incongruent joints changes the normal foot shape leading to shoe wearing problems and gait disorders.

Ligament injuries and fracture–dislocations of the tarsometatarsal (TMT) joints are relatively uncommon. The seemingly low incidence is probably owing to misdiagnosed or overlooked injuries treated as foot sprains. If overlooked or not treated correctly, TMT fracture–dislocations frequently result in painful malunion and impaired function.

Inveterate Lisfranc fractures or dislocations are defined as being more than 6 to 12 weeks old and these injuries can be anatomically reconstructed only in rare cases. A key issue in determining whether a reconstruction should be performed is whether the joint is viable and without degeneration.

One can decide between joint-sparing procedures or arthrodesis considering the amount of joint arthritis, time of primary injury, midfoot deformity, and patient cooperation.

option for joint sparing procedures are neoligamentoplasty, endobontton and dorsal bridge plate. Significant deformities cannot be corrected with ligamentplasty or endobutton stabilization; the latter should be reserved for subtle instabilities with ligamentous disruption and without arthritic changes.

Neoligamentoplasty allows for reconstruction of 3 types of ligamentous disruption and the endobutton technique primarily reconstructs the Lisfranc ligament.

Dorsal bridging plates can provide rigid fixation and allow for correction of greater deformities of the midfoot but require a large exposure. The surgical approaches for joint-sparing correction of missed Lisfranc injuries should be used with caution. They allow full functional rehabilitation in young and active individuals.

Session I- Joint Preserving Strategies (Non Ankle)

Long-term outcome of joint-preserving surgery by combination metatarsal osteotomies for shortening for forefoot deformity in patients with rheumatoid arthritis

H. Niki

St. Marianna University School of Medicine, Japan

We report the long-term outcome of joint-preserving surgery by combining metatarsal osteotomies for shortening for forefoot deformity in patients with rheumatoid arthritis (RA).

Forty-three patients (57 feet) aged 41.7–70.8 years (mean, 57.7 years) underwent a combination of first tarsometatarsal fusion and distal realignment (modified Lapidus procedure), shortening oblique osteotomies of the bases of metatarsals 2–4, and fifth ray osteotomy (modified Coughlin procedure). Patients were followed up for 64–108 months (mean, 76.6 months).

Average postoperative Foot Function Index scores for pain, disability, and activity were 10.3, 19.9, and 16.2, respectively. Average Japanese Society for Surgery of the Foot RA foot and ankle score improved significantly from 52.1 points preoperatively to 90.3 points postoperatively. Postoperatively,

41% of patients reported some forefoot stiffness, but showed no disability. Residual deformity and callosity were absent in all patients. Average hallux valgus and intermetatarsal angles decreased postoperatively from 48.5° to 8.6° and from 15.2° to 4.6°, respectively. Nonunion in 2 metatarsals, hardware breakage in 3, and mild infection in one were identified during follow-up.

With good perioperative medical management of RA, surgical repositioning of the metatarsophalangeal joints by proximal metatarsal shortening and consequent relaxing of the surrounding soft tissue shows successful long-term results.

Session I- Joint Preserving Strategies (Non Ankle)

Joint Preserving Surgeries for Great toe Arthritis: The Options and the Evidence

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Arthritis of the first metatarsophalangeal (MTP) joint (Hallux Rigidus) is a common problem affecting approximately 1 in 40 people over the age of 50. Individuals with this condition often present with joint pain, restriction in dorsiflexion at the first MTP joint, cartilage degeneration/loss, and limitation of functional activities. As the degenerative arthritis progresses, surgical options include joint sparing or joint sacrificing operations for the first MTP joint. While first MTP fusion is a joint sacrificing procedure, it is considered to be a reliable surgical option that decreases pain and provides stability. A fusion also results in loss of first MTP joint motion, which can interfere with functional activities such as running and jumping and eventually lead to altered biomechanics and pain at other adjacent joints.

With an emphasis on staying active, patients seek care focusing on joint preservation procedures for great toe arthritis. Surgeries that are considered joint sparing include interpositional arthroplasties, partial/total joint replacements, interpositional implants and decompression osteotomies. The majority of the evidence in the literature for motion preserving treatment of Hallux Rigidus, however, is based on Level III, IV or V studies. Surgical decision making and recommendations to patients needs to be based on an understanding of the basic science and clinical risks and outcomes for these surgeries. This talk will highlight this information for the most commonly performed joint preserving surgeries of the 1st metatarsophalangeal joint.

Session 2- Obtaining and Maintaining a Stable Syndesmosis

Intraoperative techniques of assessing the anatomic reduction of the fibula and the posterior fragment

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Ankle fractures with involvement of the syndesmotic integrity have a substantially poorer prognosis than those without, in particular, if non-anatomic reduction occurred during surgery. Mid- to long-term results show inferior functional outcome and more rapid development of posttraumatic osteoarthritis in those cases. CT scan analyses of both ankle joints have demonstrated that even minor degrees of malreduction have considerable potential to trigger this process. There is an ongoing debate how an anatomic reduction or a residual malalignment of the fibula could adequately be evaluated intraoperatively. While several authors recommended that a skillful application of intraoperative 2-D fluoroscopy could provide a sufficient tool for assessment of anterior-posterior displacement of the fibula within the fibular groove, a widening of the tibio-fibular clear space and even fibular rotation by careful interpretation of the lateral and the mortise views applying the 3 rules of B.G. Weber, others could demonstrate in prospective and multicenter studies that the routine application of intraoperative 3-D fluoroscopy helped to detect and correct fibular malalignment in up to 39% of the cases making posteroperative CT scans and an eventual secondary surgical correction unnecessary. In particular, fibular torsion can hardly be made visible by any non 3-D imaging technique despite the fact that there is little consensus how much torsional deviation is tolerated clinically and should be corrected for.

Apart from the spatial position of the fibula the posterior tibial fragment has gained new relevance for its contribution to tibio-fibular stability exceeding the traditional aspect of articular congruence of the ankle joint in terms of mere size aspects of the posterior fragment. Nowadays, the role of the posterior fragment for restoration of tibio-fibular stability and integrity of the fibular notch has been appreciated. Anatomic reduction of the posterior tibial fragment could make tibio-fibular transfixation via screw or suture dispensable creating a higher amount of stability than any of the current transfixation techniques of the syndesmosis. A classification has been developed recently to discriminate four different types of posterior malleolar fractures which represents a guide for therapeutic decision-making (Bartoníček). Therefore, intraoperative application of 3-D fluoroscopy creates the basis to verify anatomic vs. non-anatomic reduction of both the posterior fragment and the syndesmosis. The almost constant rate of intraoperative revision exceeding 20% with the routine use of 3D fluoroscopy supports the notion that this technique which prolongs the surgical time less than 7 minutes improves the clinical outcome following more complex ankle fracture types. This is still valid acknowledging that intraindividual asymmetry of fibular position and rotation has been described which consequently speaks in favour of a preoperative CT scan of both ankles or a preoperative scan of the non-injured side via 3D fluroscopy.

Session 2- Obtaining and Maintaining a Stable Syndesmosis

Strategies to obtainstdesmosis reduction in acute trauma

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Syndesmotic disruption in acute trauma usually results from external rotation injuries and may affect the whole syndesmotic complex, and almost always there is an associated fibula fracture. Reduction and fixation of the fibula fracture does not assure anatomic reduction of the distal tibiofibular interconnection. Residual displacement in all three planes can remain, with shortening and external rotation of the fibula and widening of the tibiofibular space being the most common. In order to avoid this complication, an open reduction of the syndesmosis and thorough image evaluation are advised. Open reduction permits visualization of the perfect fitting of the anterior fibula into the incisura fibularis. Image evaluation includes radioscopic AP, mortise and talar dome lateral views, comparative to the normal side. Intraoperative CT-scan is becoming more available in many centers and may play a role in the control of syndesmosis reduction. The length of the fibula can be assessed by direct viewing of the relationship of the articular surfaces of the lateral malleolus and the tibial plafond and also by analyzing the talocrural angle and the dime sign. Anteroposterior displacements of the fibula are best identified by the

talar dome lateral view and CT-scans. Rotational malalignments are the most difficult to identify and even CT-scan is not fully reliable. Every effort to obtain anatomic syndesmotic reduction must be tried in these very common injuries.

Session 2- Obtaining and Maintaining a Stable Syndesmosis

Is Open reduction for Syndesmotic injury an optimal treatment?

R. Simon

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Syndesmosis injuries occur when there is a disruption of the distal attachment of the tibia and fibula. These injuries occur up to 18% of ankle sprains and the incidence increases in the setting of athletic activity and road traffic accidents. Un-proportionate pain around ankle should always lead to the suspicion. Recognition of these injuries is of paramount importance to preventing long-term morbidity. Diagnosis and adequate treatment of these injuries requires a thorough understanding of the normal anatomy and the role it plays in the stability of the ankle. Imaging workup in all cases should consist of radiographs with the physiologic stress of weight bearing and at times further imaging with external rotation stress testing or magnetic resonance imaging are warranted.

All unstable injuries should be treated operatively. This consists of stabilizing the syndesmosis with either trans-syndesmotic screw or tightrope fixation. Screws provide rigid fixation but various studies have mentioned up to 50% of mal-reduction in postoperative CT scan after closed reduction screw fixation. Even after open reduction, post op CT has shown malreduction but the incidence is much less. It has been proved from many studies that patients with mal reduced syndesmotic injuries demonstrated significantly worse functional outcome.

With the advent of tight rope fixation which allows micro-motion and external rotation of fibula the need of open reduction might have come down but still not fool proof for mal reduction. Whatever is the method of fixation, it is the execution of proper technique that works. Open reduction and fixation of syndesmosis is found to be optimal and recommended to minimize this complication of mal reduction and subsequent long term complication.

Session 2- Obtaining and Maintaining a Stable Syndesmosis

Arthroscopic Criteria for the Diagnosis of Subtle Syndesmotic Injury

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The diagnosis of subtle injuries of the syndesmosis can be challenging; stress views, MRI, and clinical examination alone all have considerable variability. Arthroscopy has been suggested as an objective means of making the diagnosis, but the proposed arthroscopic criteria to define instability have until recently been unsupported by data. An observed gap of 2 mm between the tibia and fibula under stress has been used as an accepted ad hoc criterion by several studies. The ability to twirl a 3 mm probe within the syndesmotic space has also been recommended, as has subjective evaluation of the quality of the observed soft tissue structures. A careful review of the literature reveals minimal support for any of these arthroscopic tests in the form of biomechanical validation or clinical outcome data.

Recent biomechanical work at our center has demonstrated specific correlations between the ability to pass spherical arthroscopic sounds into the tibiofibular space under arthroscopic visualization and lesions of the syndesmotic ligamentous complex.

Passage of a 3 mm spherical probe indicates, at a minimum, disruption of the AiTFL and the IOL. Passage of a 2.5 mm. spherical probe indicates the presence of some degree of pathology, but it may be confined to the AiTFL only. The 2.5 mm test, however, has poor negative predictive value; isolated disruption of the AiTFL alone cannot always be reliably distinguished from the intact state by arthroscopic stress.

Session 3- Plantar Plate Repair or Not

The evolution of my algorithm to the plantar plate problem

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Instability of the lateral MTP-joints specially the second MTP joint is a relatively frequent deformity. Patients generally notice pain and swelling around the MTP joint as primary symptom.

Lowell Weil presented in 1992 in Europe a joint preserving, intraarticular shortening osteotomy, and Barouk first published it in 1996. A real hype around this technique started. At this time following the results from Johnstons paper in 1994[1] and our own cadaveric studies[2] lead us to the impression that the plantar plate rupture developed at the proximal insertion on the plantar neck of the metatarsal. For us also the incidence of floating toes after Weil osteotomies supported this theory. We indicated the “classic” Weil osteotomy for all types of subluxed and dislocated MTP joints but noted a number of failures like floating toes or stiff MTP joints.

Following Coughlins research Gregg[3] reported a combination of direct plantar plate repair and A Weil osteotomy. This principle was then popularized by Nery and Coughlin. We noted a high rate of stiff MTP joints following this combination. Henry and Besse reported in 2011[4] the possibility of a minimal invasive lesser distal metatarsal osteotomy. Our recent algorithm for a dislocated MTP joint is the open Weil osteotomy with resection of a bone slice and in case of subluxation or cross over toe deformity a minimally invasive DMOO.

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Session 3- Plantar Plate Repair or Not

The Plantar Plate Repair: A significant step ahead to re-establish the balance of the lesser MTP joints.

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The plantar plate has gained increasing attention as an important structure of the lesser metatarsophalangeal joint (MTPJ). Its role in the stability and balance of the MTPJ has been the subject of several studies. Assessment of plantar plate injury relies on focused observation and targeted examination utilizing clinical signs and physical tests that strongly correlate with tear. Imaging studies help grade the lesion and detect possible coexisting pathology.

The goal of conservative therapy is to halt progression of the disease and relieve painful symptoms. However, the patient should be advised that conservative treatment might not prevent worsening of MTPJ instability. It is imperative that an intra- or periarticular cortical steroid injection be avoided because it may weaken the stabilizing soft tissue structures around the joint and accelerate the progression of instability.

The basic principles of the surgical treatment can be summarized as follows: (1) repair the plantar plate by suturing the tears, (2) reinsert the plantar plate at the base of the proximal phalanx, (3) repair the collateral ligaments (proper and accessory) as well as the articular capsule and extensor hood, and (4) create an harmonic metatarsal parabola to achieve anatomical and functional balance of the forefoot region.

Given the extent of dissection and soft tissue release in a small anatomical area, all the surgical steps must be performed as gently as possible to minimize scarring as well as mass-like retraction of transected structures. Reefing and balancing of ligaments and articular capsule followed by careful hemostasis in all dissected planes at the end of the procedure helps prevent joint stiffness with scarring and tissue retraction.

Postoperative Care: the defect is nearly healed within 6 weeks but requires another 4 to 6 months to mature completely. The repaired toes must be protected during this period of time. We recommend keeping the toes in 20 degrees of flexion in a postoperative shoe for 6 weeks. An aggressive rehabilitation program starts at the end of the first week to reduce scarring of the surgical incision and to strengthen the flexor tendons and maintain joint mobility. It is crucial to avoid passive and active dorsiflexion of the toes for 6weeks to avoid damaging the plantar plate sutures. Taping of the affected toes in light plantar flexion must be continued for 3 months and is useful to minimize scar formation during the healing process. Long-term postoperative measures include the use of low-heeled shoes with wide toe boxes for 6 months after the surgery. An alternative option is the use of a rocker-bottom sole shoe that reduces the extension stress applied to the MTP joints. High-impact sports activities should be avoided in the first postoperative year. Return to play should occur gradually and carefully to protect the surgical repair and prevent reinjure.

Session 3- Plantar Plate Repair or Not

Open reduction and ligament reconstruction for complete or incomplete dislocation of the lesser metatarsophalangeal joint with hallux valgus

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We have performed a proximal supination osteotomy combined with open reduction and reconstruction of the collateral ligaments (the checkrein procedure) for hallux valgus with complete or incomplete dislocation of the lesser MTP joint. We present our surgical procedure and outcomes, and discuss whether a plantar plate repair is necessary for dislocation of the lesser MTP joint.

Surgical Technique: A distal soft-tissue procedure and a proximal supination osteotomy using a locking X-plate were done. Open reduction and the checkrein procedure combined with a proximal shortening osteotomy of the lesser metatarsal were done for dislocation of the lesser MPT joint.

Results: Thirty-two feet were treated with our procedure (average follow-up duration: 74 months). The Japanese Society for Surgery of the Foot score improved significantly from an average of 51 points preoperatively to 90 points postoperatively. The average HV and IM angles decreased significantly from 47° and 18° preoperatively to 6° and 5° postoperatively, respectively. There were no feet with postoperative complete dislocation of the lesser MTP joint, but five feet had incomplete dislocation.

Discussion and Conclusion: Recently, a plantar plate repair with Weil osteotomy has been performed for lesser MTP joint instability. However, our intraoperative findings showed that the plantar plate was atrophied or disappeared in most of our patients. It might be difficult to be treated with a plantar plate repair for dislocation of the lesser MTP joint. The intermediate-term results of our procedure suggested that the checkrein procedure which is collateral ligament reconstruction without a plantar plate repair was effective and durable for dislocation of the lesser MTP joint.

Session 3- Plantar Plate Repair or Not

Surgical Strategies, Pearls and Pitfalls for the Plantar Plate Injuries

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The significance of the plantar plate complex as the primary stabilizer of the metatarsophalangeal joint in the lesser toes has been demonstrated in the last decades. Overloading of the lesser metatarsophalangeal joint from a hypermobile first ray, dorsiflexed first ray, hallux valgus, inflammatory arthropathy, or long metatarsal bones has been recognized as contributing factors. The success of plantar plate repair depends on both correction of contributing factors and meticulous repair of the attenuated soft tissue. This presentation covers surgical strategies, pearls, and pitfalls related to plantar plate repair ranging from making an accurate diagnosis to postoperative care. Benefits of surgical techniques including transtendinous and intermetatarsal approaches are discussed.

Both transverse and longitudinal tears of the plantar plate can be repaired using a suture passer. Modification of the Weil osteotomy by adding a mediolateral translation can augment the correction of coronal plane deformity. Residual extension deformity of the metatarsophalangeal joint should be avoided by a complete soft tissue release with a possible flexor tendon transfer. Toe amputation can be considered as a last resort especially in the elderlies where prolonged immobilization can be detrimental to general health.

Session 4- Ankle Fusion or TAR

Ankle Arthrodesis or Arthroplasty either way it is all about the forces

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In the evolution of the management of Ankle arthritis we now at the point where we have a low risk and reliable way of doing a fusion arthroscopically and ankle replacements which may achieve an ODEP rating of 5 and 10A. Patient satisfaction rates with arthroscopic fusion show good or excellent results in approximately 85% at 10-15 years with very low risk of complications. Similarly getting to the point where arthroplasty survivorship at 10 years may get to 90%, is a major change to the situation 25 years ago when we had techniques that had high complication rates and proven 10 year survival of 70 or 80% at best. So the question is how do we push things further. The intention of this presentation is to look at how we might have to push clinical practice and analysis to diminish the effects of those forces which define the evolution of deformity in ankle arthritis. To try to reduce the effect of those forces on either the other joints in the foot or an arthroplasty whether the choice of the surgeon and patient is for an arthrodesis or an arthroplasty should be an area of growing concentration in our aims of improving outcomes of either procedure.

Despite the traditional impression that the cavovarus foot with ankle arthritis is more difficult treat, increasingly it is the progressive flat foot with arthritis which is proving to be the more difficult to treat once there is established arthritis with deformity. This may be because of difficulties in resolving the load line of the limb and the ground reaction force. The key is that the alignment of the limb, ankle and foot must permit free movement of the mid foot and subtalar joint.

Session 4- Ankle Fusion or TAR

Ankle Arthrodesis versus TAR

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Ankle arthrodesis constitutes the gold standard for the treatment of postraumatic ankle osteoarthritis. Total ankle replacement has been developed as an alternative surgical option with motion preserving advantage. However, relative benefits of ankle replacement remain unclear.

The objective of this study was to compare clinical, radiological results and complication rates in patients with postraumatic ankle osteoarthritis treated with arthrodesis and ankle replacement.

Material and methods: A retrospective study was made between 2007-2013 with postraumatic ankle osteoarthritis treated with ankle replacement (group 1) and ankle arthrodesis (group 2). Patients between 18-75 years with a minimum follow-up of 2 years were included.

Neurological conditions, infections, rheumatic disease and previous ankle and mid-foot surgery were excluded. Varus-valgus correction, adjacent degenerative disease, reoperation rate and clinical evaluation (AOFAS and visual analoge scale) were evaluated.

Results: A total of 63 patients with (average age of 50) with 66 months follow-up were involved. There was no difference in terms of reoperation rate (P=.44) neither adjacent osteoarthritis (P=.62).

Varus-valgus preoperative and postoperative was 5.92 and 2.51 respectively (P=.0053) in group 1, 13.59 and 5.39 (P=.0002) in group 2. AOFAS score was 88 in group 1 and 92 in group 2. The visual analoge scale score was 4 in group 1 and 2.5 in group 2.

Conclusion: Ankle replacement resulted in similar varus-valgus correction, adjacent degenerative disease, complication rate and functional results compared with arthrodesis in our study. Ankle replacement could be a suitable surgical option for the treatment of posttraumatic ankle osteoarthritis.

Session 4- Ankle Fusion or TAR

Total Ankle Arthroplasty: Managing Complications and Osteolysis

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Background: Total ankle arthroplasty is increasingly used as an alternative to arthrodesis to treat advanced ankle arthritis. However, the outcomes and postoperative complications are not well described. The purpose of this study was to analyze the incidence and patterns of complications after TAA, and to establish guidelines to prevent and treat them.

Methods: The incidence of complications after total ankle arthroplasty has been reported to be between 37% and 60%. We evaluated perioperative complications such as fractures, wound problems and peripheral nerve injury as well as implant malpositioning, heterotopic ossification, and periprosthetic osteolysis.

Results: Complications occurred mainly in early cases. The incidence of complications was higher in the post-traumatic osteoarthritis than primary osteoarthritis. Preoperative varus deformity greater than 10° showed increased risk for postoperative implant malpositioning. In our study, the prevalence of neurologic injuries after primary TAA was about 15.3 % and associated with low levels of patient satisfaction and poor clinical outcomes. The frequencies of postoperative heterotopic ossification after TAA reported ranging from 4% to 82% for different implant designs and heterotopic ossification place it in the posterior aspect of the ankle. We also divided heterotopic ossifications into five classes according to the severity and heterotopic ossification is associated with reduced ankle motion and a poor clinical outcome. Osteolysis after TAA is a challenging clinical problem which is a principle cause of aseptic loosening, subsidence and revision surgery. We analyzed causes and inducing factors, pathologic findings, and gene expression of osteolysis, and proposed proper treatment guideline based on them.

Conclusions: Complications after TAA are associated with poor clinical outcomes and increased reoperation and subsequent patient burden. Therefore, making efforts to reduce these complications and preventing the occurrence of osteolysis will be the most important in future research.

Session 4- Ankle Fusion or TAR

Comparing effectiveness of ankle arthrodesis and ankle replacement using patient self-reported outcomes and wearable technology

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Introduction: We tested clinical equipoise in ankle arthrodesis and ankle arthroplasty during a time of transition from older to newer generation implants using a prospective cohort.

Methods: We performed a prospective cohort study comparing outcomes in 273 consecutive patients treated for ankle arthritis by arthrodesis or ankle arthroplasty between 2005 and 2011. Adult Patients with end-stage ankle arthritis, who were ambulatory and willing and able to respond to surveys were included. At baseline and at 6, 12, 24, and 36 months follow up visit, participants completed a pain and satisfaction survey, a Musculoskeletal Function Assessment (MFA), and a Short Form-36 (SF-36) survey

Results: Linear mixed effects regression adjusted for baseline differences (age, BMI, and surgery type.) There were no significant baseline differences in MFA or SF-36 by surgery type. There was significant mean improvement after surgery regardless of procedure ($p<0.001$). The greatest improvement occurred at 6 month follow-up; Mean ± SE, (%) improvement was 12.6±0.7, (32%) for MFA, 22.0±1.4, (58%) for Physical Function (PF); 32.4±1.6, (96%) for Bodily Pain (BP), 4.0±0.2, (60%) for pain score. Average improvement was significantly better with arthroplasty in MFA (3.6 ± 1.6, $p=0.023$) and in PF (7.5 ± 2.9, $p=0.0098$). The difference between arthrodesis and arthroplasty was greater for patients receiving the newer Salto Talaris implant; average improvement for MFA (3.9±1.4, $p=0.031$), PF (8.8±3.3, $p=0.0074$), BP (7.3±3.6, $p=0.045$), and pain score (0.8±0.4, $p=0.038$).

Conclusion: Both ankle replacement and ankle arthrodesis are highly effective treatments for ESAA. When treated by surgeons with expertise in both foot reconstruction and hip and knee arthroplasty, patients reported improved comfort and function with both treatments. Average improvement was significantly better in those with arthroplasty in MFA and in SF-36 PF scale (7.5 ± 2.9, $p=0.0098$). That difference was greater when earlier generation implants were removed from the analysis. Younger patients had greater functional improvements than older patients. Patients with low BMI had better improvement that those with high BMI.

Session 5- Forefoot: Minimally Invasive or Not

Shortening chevron osteotomy for treatment of hallux rigidus

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Hallux Rigidus is a condition characterized by degeneration of the first metatarso-phalangeal (MTP) joint. Limited range of motion and pain are the main symptoms.

These symptoms result from cartilage degeneration, altered joint mechanics, and osteophyte formation, especially on the dorsal aspect of the first MT head.

Most commonly the etiology of hallux rigidus is idiopathic. However, the true etiology is unknown. Some authors have associated hallux rigidus with athletic activities like running, osteochondritis dissecans, metatarsus primus elevatus, flat first MT head, hallux valgus interphalangeus and family history.

Surgery is indicated when patients have no relief with conservative treatment.

There are two main types of treatment regarding the joint: reconstructive (osteotomies) and destructive (excisional arthroplasty joint replacement and arthrodesis), depending on the severity of the arthrosis, age, etiology, patient functional demand and expectations.

Distal metatarsal osteotomies allow decompression of the MTP joint, thus improving pain and function.

The V shape distal metatarsal osteotomy proposed by Younsgwick, is considered a modification of Austin-Chevron. This is a very versatile osteotomy; it allows shortening of the first metatarsal (decompressing de joint) and moving laterally or downwards the metatarsal head when needed.

The authors present their wide experience treating patients with hallux rigidus grade II and II/III with a shortening chevron osteotomy and make a small revision of the literature about this joint preserving osteotomy.

Session 5- Forefoot: Minimally Invasive or Not

First Metatarsophalangeal Arthrodesis using endomedullary screw fixation. Open or percutaneous?

P. Sotelano

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Arthrodesis of the first metatarsophalangeal joint (AMTP) has long been recognized as an operative option for the treatment of several entities which affect the Hallux metatarsophalangeal joint (MTP) as severe hallux rigidus (HR), severe hallux valgus (HV) deformities, failed HV or HR procedures, previous infection, rheumatoid arthritis, post traumatic conditions. It is considered the gold standard treatment for end-stage arthritis.

In 2013, we published our experience in first metatarsophalangeal joint arthrodesis with an anterograde endomedular screw fixation (AMTP EM) with open technique.

In this study between 2003 to 2009, were evaluated 101 feet at a mean follow-up of 32 months. Preoperative AOFAS average score was of 38 points and postoperative AOFAS was 85 points. Outcome categorization of the cases by the postoperative AOFAS score was excellent in 62%, good in 31%, fair in 6% and poor in 1%. The consolidation rate after radiological evaluation was 90.1%. There was no consolidation in five cases (4.95 %).

In our institution, we have performed percutaneous forefoot surgery since 2001. Due to the good results achieved with open AMTP arthrodesis with an endomedullary screw, since 2009 we have performed the same technique with one 5.5 endomedullary screw and one 2.4 cross screw to avoid rotation with percutaneous technique.

Will present our preliminary study and result with this technique. Between 2010 and 2012, we performed 24 feet with average 48 months of follow up. Preoperative AOFAS score average was 37 points and postoperative was 86 points. Pseudoarthrosis was present in one foot (4%) and skin burn in one foot (4%) due to the prolonged use of the reamer for cartilage removal.

Session 5- Forefoot: Minimally Invasive or Not

Comparison of Minimal Invasive Surgery and Open Chevron Osteotomy for the management of Hallux Valgus: Mid to Long Term Clinical Results

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Background: Minimally invasive surgery(MIS) is gaining an increasing popularity. The aim of this study is to compare the mid to long term clinical results of MIS and open Chevron osteotomy(OCO) for the treatment of hallux valgus.

Methods: This was a retrospective study. A total of 169 consecutive patients(10men, 159 women) , 253 feet were included in this study with an average follow up duration of 85 months. They were divided into two groups: the MIS group(150 feet) and the OCO group(103 feet). The full weightbearing X-rays were obtained preoperatively and postoperatively for the evaluation of hallux valgus deformity. The AOFAS MTP-IP score and VAS score were utilized for the assessment of functional outcome of the surgery. The operation time and cost for each patients were also recorded.

Results: The preoperative and postoperative clinical results and radiological parameters improved significantly for both groups($P>0.05$), however there was no statistically significant differences for postoperative clinical results, and postoperative HVA, IMA, DMAA, SP($P>0.05$) between MIS and OCO groups. Significant differences were found in postoperative 1MT length, operation time, cost and the rate of postoperative transmetataralgia($p<0.05$).

Conclusion: The mid to long term results demonstrated that MIS have a comparable clinical results to open Chevron osteotomy for the treatment of hallux valgus.

Session 5- Forefoot: Minimally Invasive or Not

Big surgery for big forefoot deformities: It's not about the incision but the result

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Multiplaner forefoot deformity correction requires a systematic approach. Applying fundamental principles that use corrective fusions, osteotomies and soft tissue balancing give reproducible results for this difficult patient population. The use of these techniques will be highlighted. The need for open incisions in order to achieve superior outcomes will also be highlighted.

Session 6- Diabetes/Charcot

The Use Of External Frame In Charcot's Foot Reconstruction

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Reconstructive orthopedic surgery (ROS) is indicated for deformities that can be seen in advanced stages of Charcot's neuroarthropathy.

As is well-known, neuropathic Charcot's osteoarthropathy is a noninfective, destructive lesion of a bone and joint resulting from a fracture or dislocation, or both, in a patient who has peripheral neuropathy.

According to the Eichenholtz classification, which is based on the clinical and radiographic changes of the foot, surgical treatment is to be carried out in stage III.

Surgical treatment is of two types: **ostectomy**, used to remove the osseous prominences that cause recurrent ulceration and consequently bone infection and **arthrodesis**, which restores the alignment and stability of the involved joints.

In both surgical treatments the goal is threefold: to obtain a plantigrade position of the foot, to restore the stability and alignment of the foot and ankle so that footwear and brace can be worn and to reduce the ulcerative risk.

Severe Charcot deformity or instability of the foot and ankle is treated with realignment of the involved joint and stabilization by arthrodesis.

Surgical treatment of a Charcot foot is usually carried out in Eichenholtz stage III, in the quiescent phase of the fracture pattern.

The contraindication of this procedure is an infection of the soft tissue and bone, leading to a higher rate of fusion failure and spreading of the infection. In these cases it is necessary to follow a two-step approach, with appropriate debridement of the infected tissues and antibiotic therapy.

A temporary contraindication is peripheral vascular disease which is less frequent, though sometimes present in neuropathic osteoarthropathy, than in the ischemic or neuroischemic foot.

Another contraindication is the inability of the patient to comply with the postoperative regimen that has to be observed for several months

Lastly, arthrodesis cannot be performed unless there is sufficient bone stock to obtain stability, particularly with regard to the heel bone.

Reconstruction follows the rules of all foot and ankle fusion surgery: resection of excess tissue and alignment of the involved bones with the creation of a plantigrade foot.

Frequently, it is necessary to perform arthrodesis of the talus-calcaneal joint when the talus bone is irreducibly dislocated and not relocatable with minimal resections.

When an internal column collapses with typical rocker bottom deformity, we follow the modern osteosynthesis procedure, using the "superconstructed" concept which is an increased and expanded stabilization of the fusion area.

All the joints of the involved area (cuneo-metatarsal, navicular-cuneiform, talus-calcaneal, calcaneal-navicular) are planed down and realigned after resection and decortication of the articular surface cartilage.

For osteosynthesis we also use low profile and modifiable angle stable plates, with circular and oval holes to adapt to the variability of screw positioning and direction as requested in Charcot neuaroarthropathy.

We often perform a stabilization of both columns, medial and lateral for enhanced stability.

Even though the retrograde locked intramedullary transcalcaneal nail had given us acceptable stabilization after five years' experience, we are now using the hybrid external fixator for the ankle and hindfoot deformity.

The external fixator allows the required assembly on the anchorage points with the use of K-wires.

Assembly with **external fixator** presents the following advantages:

- it is possible to treat both the hindfoot and the midfoot contemporaneously

- after adequate medical treatment, it is possible to treat patients with a medical history of ulcers or infection of the soft tissue
- it allows assembly flexibility and it can be applied to the different deformities that may occur in Charcot's neuroarthropathy.
- it allows prolonged immobilization, up to 3-4 months, followed by the use of postoperative non-weightbearing casts for 12-18 months
- it permits modification of alignment, by performance compression with the specific limb lengthening attachment

For the assembly, we use a classical monoaxial fixator, which is fixed to the leg with two hydroxyapatite coated pins and a U form semicircle for the posterior grip. This is stabilized with crossed and pre-charged K wires and two bars to stabilize the body of the fixator with the distal part of the U arms.

Our first recently published results (4) have shown a satisfactory percentage of success.

In Charcot neuroarthropathy, a complete bone fusion is not always necessary; in many cases a stable, correctly positioned ankylosis is sufficient.

A limit of external fixation is represented by the tibial pins, whose mobility may lead to fractures or infections.

In our experience this has happened only once and was due to premature weightbearing

Another limiting factor is represented by the handling and maintenance of the fixator - this can be overcome by careful and regular medical supervision together with the cooperation of the patient.

In conclusions, reconstruction of the Charcot foot and ankle is a valuable technique with a success rate of 80%

Amputation is a rapid and less expensive technique although it can lead to a multi-organ failure and a higher risk of mortality (4).

Undoubtedly the treatment of these patients needs to be carried out by a team of diabetologists, surgeons, orthopedics, radiologists and podiatrists. The creation of such a team in specialized units is the only way to offer the diabetic patient an acceptable quality of life after the diagnosis of neuropathic Charcot osteoarthropathy.

Suggested lectures:

1. Instructional Course Lectures Foot and Ankle
Elly Trepman , MD Editor, George A.Arangio, MD Co-Editor American Orthopaedic Foot and Ankle Society

2. Pinzur,MS:Current Concepts Review:Charcot Artropathy of the Foot and Ankle.
FAI 28,2007

3. deSouza,L:Charcot Arthropaty and Immobilization in a Weight-Bearing Total Contact Cast.JBJS,2008

4. A Papa, J. Myerson, M; Girard,290 P:Salvage, with arthrodesis, in intractable diabetic neuroarthropathic arthropathy of the foot and ankle. J Bone Joint Surg. 75A:1056-6, 1993

5. L.Dalla Paola, A.Volpe et al.:Use of a retrograde nail for ankle arthrodesis in Charcot neuroarthropathy: a limb salvage procedure.Foot Ankl Int.Sept.2007

6. L. Dalla Paola, E.Brocco, T.Ceccacci, S.Ninkovic, S.Sorgentone, MG Marinescu, A.Volpe:
Limb Salvage in Charcot Foot and Ankle Osteomyelitis: Combined Use Single Stage/Double Stage of Arthrodesis and External Fixation. Foot Ankl Int 30,12,2009

Session 6- Diabetes/Charcot

Midfoot Charcot Fixation: What Do I Prefer

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Charcot neuroarthropathy of the midfoot can induce severe instability and deformity with chronic plantar ulcerations, caused by prominent exostoses or axial malalignments and this condition should be treated surgically.

There is no consensus on the optimal method of surgical reconstruction. Different fixation techniques have been described for realignment and arthrodesis of the non-infected Charcot midfoot deformity and there is no clear evidence in the literature favoring either internal or external fixation methods.

External fixation has been shown to have a higher rate of non-union and ulcer recurrence than internal fixation, so we consider external fixation only for patients with osteomyelitis after an advanced midfoot ulcer.

Many complications has been reported as well for Internal fixation, like deep infection and wound healing issues. Options for internal fixation are interfragmentary screws, plate and screws, intramedullary cannulated screws, and solid intramedullary fusion bolt, that reported initially lower non-union rate, but more recent studies showed high incidence of insufficient stability and rod loosening, and suggest to add an extra rod or plate to the medial column and eventually the lateral foot column as well.

In this presentation it will be showed our surgical evolution treating midfoot Charcot, and the way we prefer actually to stabilize non infected unstable midfoot Charcot arthropathy after realignment, in order to provide better stability to achieve osseous fusion.

Session 6- Diabetes/Charcot

Tendon Contracture as The Determinant of Outcome in the Treatment of Diabetic Foot Problems

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Introduction: Diabetes mellitus is one of the most common metabolic problems. Examples of its chronic complications include neuropathy, retinopathy, and diabetic foot ulcers. Some diabetic feet heal well but the others were cumbersome. This study investigates the determinants of outcome in the treatment.

Methods: Factors at presentation which influenced the course of the disease and response to treatment were assessed in 226 patients with diabetic foot problems. The dependent variable were treatment outcomes characterized by the number of surgical procedures needed to avoid amputation. Independent variables included demography, presence of tendon contracture, and patients compliance. Statistical measurements was performed using univariate and multivariate analyses.

Results: Univariate analysis revealed no significant association between demographic variables and the number of surgical procedures ($p>0.05$). Analysis of follow-up variables showed significant results for patients with tendon contracture and low compliance ([<0.05). Multivariate analysis demonstration significant association between tendon contracture and outcome.

Conclusion: We conclude that the tendon contracture is major determinant of the outcome of diabetic foot problems. Therefore, although the patients must be thoroughly cared for, the assessments and intervention for this problem should be emphasized in the treatment strategy.

Session 6- Diabetes/Charcot

Management of the Diabetic/Neuropathic Patient with an Ankle Fracture

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Definitive treatment of diabetic patients with an ankle fracture should include a thorough evaluation of known risk factors, especially the loss of protective sensation. Patients with complicated diabetes have a 3.8 times increased risk of overall complications, 3.4 times increased risk of a non-infectious complication (malunion, nonunion or Charcot arthropathy) and 5 times higher likelihood of needing revision surgery/arthrodesis when compared to patients with uncomplicated diabetes. If physical exam indicates loss of protective sensation with the Semmes-Weinstein 5.07 monofilament, it is important to alter the typical treatment regimen to help prevent subsequent Charcot arthropathy and deformity or failure of operative treatment.

The standard fixation techniques may not provide adequate stability in the neuropathic patient so augmentation of the fixation with multiple syndesmotic screws, transcalcaneal-talar-tibial pins placed retrograde or external fixation is frequently used to increase stability, promote union and prevent failure of the hardware.

In cases of significant medical comorbidities, poor soft tissue envelope and an unstable fracture pattern, a closed reduction with percutaneous screw fixation augmented with retrograde transcalcaneal-talar-tibial fixation is utilized. Strict nonweightbearing in a total contact cast is necessary until the pins are removed and thereafter until sufficient healing has occurred to allow weightbearing which typically is 3 months.

The typical ankle fracture with associated peripheral neuropathy would be kept non-weight-bearing for approximately 3 months (as opposed to 6 weeks) followed by gradual increased weight-bearing in a cast for up to four to five months from surgery and the fracture demonstrates radiographic union followed by use of an AFO for up to one year to prevent late development of a Charcot joint.

Session 7- Trauma

Fractures of the posterior malleolus – old dogmas and new concepts?

S. Rammelt

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Fractures of posterior rim of distal tibia frequently occur in the wake of malleolar fractures. Since a publication from 1940 based on low patient numbers, the dogma has been established that posterior malleolar (PM) fractures should be subjected to internal fixation if their size exceeds one third (or one fourth) of the joint surface of the distal tibia. Recently, there has been increased interest in these fragments as they represent avulsion fractures of the posterior tibiofibular (syndesmotic) ligament.

Still, there is no uniform classification and treatment algorithm for these injuries despite an increasing number of studies. Adequate evaluation of PM fractures requires preoperative CT scanning for determining the pathoanatomy of the PM fractures as well as all associated injuries to the ankle and thus individual planning of the surgical approach.

Anatomic reduction and fixation of PM fragments not only stabilizes the posterior syndesmosis, potentially obviating the need for a syndesmotic screw. It also recreates the tibial incisura and therefore alleviates anatomic reduction of the distal fibula (Fig. 1). Classification of PM fractures according to the amount of incisura involvement therefore helps with treatment planning (Fig. 2). While large fragments may be fixed indirectly with anteroposterior lag screws, smaller fragments, PM fractures with partial impaction of the tibial plafond or intercalary fragments are best reduced and fixed directly using a posterolateral or posteromedial approach.

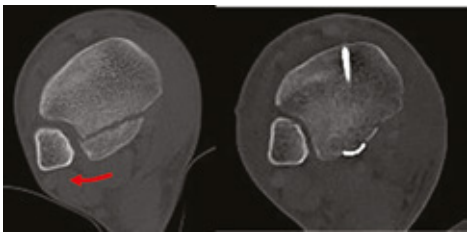

Fig. 1: Anatomic reduction and fixation of PM fragments stabilizes the posterior syndesmosis and recreates the tibial incisura for proper reduction of the distal fibula.

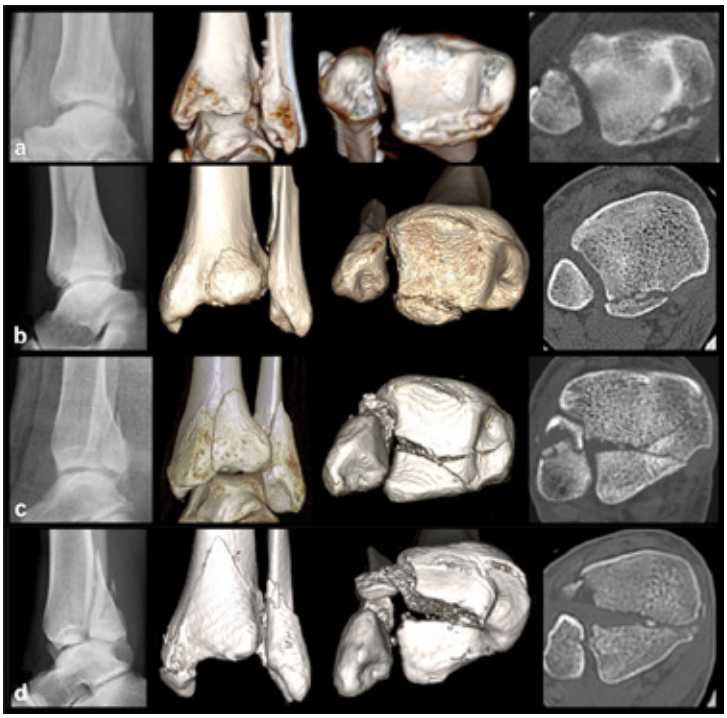

Fig. 2: Classification of PM fractures according to involvement of the incisura (from Bartoníček J, Rammelt S, Kostlivý K, Klika D, Trešl I. Anatomy and classification of the posterior tibial fragment in ankle fractures. Arch Orthop Trauma Surg 135: 505-516, 2015).

(a) Type I: extraincisural

(b) Type II: posterolateral

(c) Type III: two-part (with medial malleolar involvement)

(d) Type IV: large triangular

Type V represents irregular, osteoporotic fracture patterns (not shown)

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Session 7- Trauma

Isolated Lateral Malleolus Ankle Fractures: what is stable and what is not?

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It is generally thought that bi- and tri-malleolar fractures are unstable, as are pronation external rotation injuries resulting in an isolated high fibular fracture (Weber type-C), where the deltoid ligament is damaged or the medial malleolus fractured. It is also gradually being recognised that, not only is the integrity of the 'medial column' essential for stability of ankle fractures but also, that the vast majority of SER (Weber B-type) ankle fractures are stable and can be safely treated non-operatively. However, how best to identify the unstable, isolated, trans-syndesmotic Weber type-B supination external rotation (SER) fractures of the lateral malleolus that require internal fixation, remains controversial.

This presentation provides a rationale as to how to assess stability of these Weber type-B SER isolated distal fibular fractures using weight-bearing radiographs, and how this can help guide the management of these common injuries. Also, the crucial role of the deltoid ligament in fracture stability is explored, its anatomical features and biomechanical properties reviewed, and a sub-classification of SER-IV injuries proposed, that may aid pragmatic and safe management of these often mis-managed fractures.

Session 7- Trauma

Treatment of Residual Deformities in Foot Injuries

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Introduction: During the first hours of severe polytrauma patients, the most important priority is saving the life of the patient. Foot and ankle injuries tend to be ignored, and treatments are either delayed or rushed for amputation to avoid postoperative complications. Amputees feel a deep sense of loss when they recover consciousness after emergency treatment. The aim of this presentation is to share the outcomes of treatment for residual foot deformities.

Patient and Methods: From 1994 to 2016, we treated 79 feet with 79 patients. The mean age at surgery was 47.4 ranging from 13 to 84-year-old. The goal of treatment was to obtain a plantigrade foot. Multiplane foot deformities were evaluated using 3D-CT, and the Ilizarov external fixator was primarily used to maintain a corrected position or perform a gradual correction. For equino-cavo-varus deformities, the Japas' V-shaped osteotomy combined with extension osteotomy for the first metatarsus were performed. Gradual correction using an external fixator was used for severe equinus deformities. For infected non-union and osteomyelitis, a radical resection of the infected lesions was performed and followed by bone transport using an external fixator. The ulcers of the sole of the foot were treated with a medial plantar flap from the contralateral side.

Results: All patients obtained better foot function and were not compelled to seek amputation.

Conclusion: Surgeries for residual foot deformities are always challenging; however, patients were satisfied with the results of our operation. Demonstrating current state-of-the-art techniques in foot surgery can encourage limb salvage for traumatologists.

Session 7- Trauma

Outcome After Lisfranc Injury: What is Important?

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Background: When considering patient outcome, controversy persists as to the ideal indications for surgery and the optimal form of management for a Lisfranc injury. We hypothesized that we could identify the critical negative prognosticators for poorer outcome by looking at specific treatment modalities and re-operation rates, and by excluding hardware removal as a potential factor.

Methods: Between July 1991 and July 2016, adult patients who sustained closed, isolated Lisfranc injuries with or without fractures, and who underwent operative treatment with either open reduction and internal fixation (ORIF) or primary arthrodesis (PA) in our healthcare system were analyzed. All included patients had at least twelve months of follow up.

Results: From an initial cohort of 640 patients who were surgically treated for TMT pathology over this twenty-five year period, two hundred twenty-three patients met enrollment criteria (mean follow-up: 62.5±42.8 months, range 12-184), of which 168 (75.3%) underwent ORIF and 55 (24.1%) underwent PA. Sixty-nine (30.9%) patients had a second surgical operation for complications without statistical difference between two groups (31% in the ORIF group and 30.9% in PA group, P=1). Excluding hardware removal, 19 (11.3%) in the ORIF group and 5 (9.1%) in the PA group underwent reoperation ($p = 0.8$). Risk factors that reached significance and were predictive of unplanned re-operation included deep infection ($p < 0.001$), delayed wound healing ($p < 0.001$), and non-anatomic post-operative radiographic reduction ($p = 0.02$). Moreover, primary repair was associated with a higher reoperation rate among patients with peripheral neuropathy or with Myerson type C injuries (divergent displacement of the first and lesser metatarsals) ($p = 0.001$ and $p = 0.01$, respectively). No difference in reoperation rates could be found when comparing the two treatment groups with respect to purely ligamentous injuries, smoking, or diabetes.

Conclusion: After accounting for hardware removal, there appears to be no significant difference in overall re-operation rates between ORIF and PA following Lisfranc injury treatment. Re-operation is, however, significantly related to the occurrence of deep infection, delayed wound healing, and/or non-anatomic reduction, and patients with peripheral neuropathy or Myerson type C injuries appear to specifically benefit from PA.

Session 8- Sports-Arthroscopy

Treatment of the posterior ankle impingement by arthroscopy, Anatomic Study and surgical techniques

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We present an anatomic study about the arthroscopic posterior ankle approaches, and safe distances between the postero lateral approach and the sural nerve, and the distance between postero medial approach and the posterior tibial nerve. It was a research with 19 specimen human feet performed in our Anatomy cadaver Lab.

We also refer to indications of posterior ankle arthroscopy in the treatment of posterior impingement and also to the surgical technique we use to resolve posterior pain because of impingement at the level of posterior tibio talar joint and posterior subtler joint.

We also present the incidence of complications during these procedures, specially the incidence of Nerve injuries. We refer our tricks with the aim to avoid some of these complications.

Session 8- Sports-Arthroscopy

Foot and ankle endoscopy. Indications and limits

C. Ortiz

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Ankle and foot endoscopy indications have expanded over the years including a broad spectrum of common and also rare disorders. Over the past few years, advances in operative techniques and arthroscopic instrumentation have allowed indications to expand and replace or assist classic open surgery.

Arthroscopic surgery has been recommended for different problems:

1. Diagnosis:

- Ankle Instability (medial , lateral , Syndesmosis)
- Lesser MTP instability

2. Arthroscopic assistance for fractures:

- Pilon
- Ankle
- Talus
- Calcaneus

3. Tendon pathology:

- Achilles
- FHL
- Peroneal tendons
- Posterior tibialis
- FDL

4. Arthrodesis:

- Ankle
- Subtalar
- 1 MTP
- Triple
- Lisfranc

5. Sinovitis and OCD:

- Ankle
- Subtalar
- 1 MTP
- Chopart
- Lisfranc
- Instability:
- Ankle

6. Others: Plantar plate reconstruction, tumor resection, hallux valgus, accessory bones resection, tarsal coalition resection.

The most classical anterior ankle arthroscopy has proven to allow to preserve soft tissue envelope, thus accelerating a return to daily activities and athletic performance.

Recent studies have shown that anterior ankle arthroscopy is more sensitive when compared with preoperative physical examination and imaging in diagnosing chondral injury in chronic unstable ankle.

Few controlled, prospective studies have evaluated the efficacy of an arthroscopy. Many conclusion are sometimes extracted from reports of very few cases without long term follow up.

In a recent report by Van Dijk (2016), evidence for hindfoot endoscopy was analyzed. On the basis on the available evidence, posterior ankle impingement syndrome, subtalar arthritis and retrocalcaneal bursitis have the strongest recommendation in favour of treatment (grade Cf).

A comprehensive review of the literature on foot and ankle tendoscopy pusblished in 2014 has shown predominantly Level IV and V studies, with just 1 Level II study. On the basis of the current literature available, there is poor evidence (grade Cf) in support of Achilles, flexor hallucis longus, and peroneal tendoscopy for the common indications. There is insufficient evidence to make a recommendation (grade I) for or against tendoscopy of the tibialis posterior, tibialis anterior, flexor digitorum longus, extensor hallucis longus, and extensor digitorum longus. Although current literature suggests that tendoscopy is a safe and effective procedure, original scientific articles of higher levels of evidence are needed before a stronger recommendation can be assigned. Level of Evidence: Level IV, systematic review of Level II, IV, and V studies

The evidence has also been studied acute ankle fractures are commonly concomitant with multiple soft-tissue injuries in which arthroscopy may serve as a method for accurate diagnosis and appropriate treatment. Level of Evidence: Level IV, systematic review of Level I, II, III, and IV studies

As a general rule an arthroscopic technique should be recommended to replace a similar open procedure when damage to the soft tissue envelope is expected to be less (Achilles tendinopathy) , when total surgical time is going to be decreased (arthroscopy fracture reduction assistance) or when surgical goal is better achieved this way (total synovectomy)

On the other hand, if surgeon is not familiarized with the arthroscopic technique, or when using it can potentially cause more soft tissue damage or jeopardize the surgical goal, then an open approach should chosen.

One good example of this is arthroscopic haglund deformity resection compared to a minimally invasive technique performed with MIS instrumentation. MIS technique is much faster, less technically demanding and probably similarly effective

In my personal opinion some of the recently described arthroscopic techniques are technically too demanding to be recommended in every case. At this moment I would be cautious to recommend arthroscopic technique for every case of: haglund resection, peroneal tendon grove deepening, hallux valgus, lesser MTP surgery, some 1 MTP procedures (like cheilectomy), some accessory bone resection (like those completely extraarticular : navicularis accessory).

Complications:

Although arthroscopic technics typically produce less soft tissue damage and quicker recovery time compared with a similar open procedure, it has some reported complications.

The most common complication is neuritis of the superficial peroneal nerve in anterior ankle arthroscopy (most of the time it disappears after a few weeks). Some other specific complications have been described, such as: tendon damage, pseudoaneurism, etc

Summary:

Arthroscopy is an extraordinary tool to treat a variety of foot and ankle problems with expanding indications. I would recommend to continue our efforts to collect evidence to prove which patients would benefit with this techniques. A case report may not be enough evidence to consider a procedure the gold standard for every case.

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Session 8- Sports-Arthroscopy

Arthroscopic repair/reconstruction for lateral instability of the ankle

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Recently several kinds of arthroscopic surgery have been reported for the treatment of lateral instability of the ankle. The surgical procedure is chosen according to the result of stress ultrasonography (S-US) for the remnant.

Arthroscopic Broström repair is performed in cases which showed clear ligament fiber in S-US. Medial midline (MM) portal is used as viewing portal and an accessory anterolateral (AAL) portal as a working portal. The ATFL is reattached to the fibula with an anchor suture using modified Lasso-loop stitch technique.

Reconstructive surgery should be performed in cases of no fiber in S-US. Anti-RoLL is an anatomical reconstruction of the ankle lateral ligaments and includes arthroscopic (A-AntiRoLL) and percutaneous procedure (P-AntiRoLL). A-AntiRoLL is performed if there are any concomitant intra-articular lesions. An autologous gracilis tendon is harvested on ipsilateral knee, and processes it to be a Y-shaped graft. For the approach to fibular attachment, the viewing portal is medial midline portal (MM) and the working portal is subtalar portal (ST). For the approach to talar attachment, the viewing portal is MM and the working portal is accessory anterolateral portal (AAL). For the approach to calcaneal attachment, the viewing portal is ST and the working portal is AAL. After making the bone tunnels in diameter of 6mm and depth of 20mm at each attachment, the graft is introduced by all inside-out technique and fixed with interference screw in diameter of 6.0 mm. If there are no concomitant intra-articular lesions, I recommend P-AntiRoLL. It is easier than A-AntiRoLL technically.

Session 8- Sports-Arthroscopy

Treatment Algorithm for Talus OCD

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Articular cartilage injuries affect approximately 900,000 individuals in the United States every year

Osteochondral injury of the talus can be challenging to treat because the damaged articular cartilage has a poor intrinsic reparative capability.

Microfracture is the most common initial procedure for treatment of talus OLT

Reparative techniques such as excision combined with curettage, drilling or microfracturing (Bone Marrow Stimulation, BMS) were the first to be described

The effectiveness of these techniques that involve microfracture of the subchondral bone to allow stem-cell migration from the marrow cavity into the osteochondral defect has been well documented with a success rate that is approximately 72%

Large lesions (greater than 1.29cm2) or delaminating lesions may not respond well to microfracture, and have less reliable outcomes

Cystic lesions also may not respond well to bone marrow stimulation; therefore, a treatment algorithm based on the size, location and depth of the lesion can guide the provider toward a successful treatment outcome.

To improve these outcomes, a myriad of treatment options have emerged over the past decade, including: autologous chondrocyte implantation (ACI), matrix ACI with collagen or hyaluronic scaffolds, bone marrow aspirate, osteochondral allograft and live juvenile cartilage allograft.

The current treatment algorthim is based on sized of the lesion

Small Size OCD (< 5 x 5 mm, minimal cystic change)
Microfracture, Drilling or Curretage

Medium Size OCD (5 x 5 mm to 10 x 10 mm, or smaller with cystic change)

Microfracture, Drilling or Curretage
MACI (not available in USA), juvenile allograft, bone marrow aspirate

Moderate Size OCD (10 x 10 mm to 20 x 20 mm)
Matrix type ACI (not available in USA), juvenile allograft, bone marrow aspirate
ACI, Allograft or Autograft osteochondral graft

Large Size (> 20 x 20 mm)
Allograft or Autograft osteochondral graft
Bulk allograft

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Session 9- What's New in Foot and Ankle

Need for new concepts in joint implant surgery?

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Polyethylene has since the beginning of the 1960s been part of total joint replacements. The other part has been metal or ceramics. While total hip and knee replacement with this constellation have survival rates in the high nineties at 10 years follow-up, total ankle replacement (TAR) is only about 80 per cent, in spite of offering mobile meniscal bearing and biological coating of the metal since the 1980s (BP and STAR) . There are several reasons for this, but mainly neglecting the tibio-calcaneal alignment, ankle joint stability, and cortical bearing of the components are features that could lead to failure. Little attention has been paid to the materials when it comes to Youngs modulus of elasticity. As implants are seated into cancellous bone – Youngs modulus about 15 GPa – and the implants moduli ranges from 110 to 360, there is an obvious mis-match which could lead to stress rising, a not unknown finding in most implants. Biological solutions are tried, but so far no one has been able to produce durable hyaline cartilage, whether this originates from necro-cartilage, cartilage transplantation or stem cell derivates. While we are waiting for true biological solutions, we should look for new and available biomechanical solutions.

For the last 30 years PEEK (poly-ether-ether-ketone) has been investigated as possible alternative to metal and ceramics. The material can be produced to mimic Youngs modulus for bone. It is strong, and has excellent biological features. It is inert, temperature resistant, can be sterilized, creates extremely little debris, and has a low friction coefficient : 0.01-0.04 as compared to steel against steel: 0.15. It can be coated with HA and Antibiotics can be incorporated. It is tested and FDA approved for screws, plates, cages and spinal disc prosthesis.

PEEK and its derivates are obvious interesting materials which should be tried in implants in the future.

Session 9- What's New in Foot and Ankle

Treatment of chronic deltoid ligament insufficiency, our option: repair with Internal Brace™ augmentation

G. Carcuro

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Background: Patients with chronic deltoid ligament insufficiency (CDLI) present a challenging situation in foot and ankle surgery. Although numerous surgical procedures have been described, optimal treatment is still a matter of debate. While the treatment armamentarium ranges from simple ligament repair to complex deltoid reconstructions with or without realignment osteotomies, direct repair augmented with an Internal Brace™ (Arthrex, Inc., Naples FL, USA) device appears to be an attractive intermediate option. We investigated functional outcomes and complications in patients with CDLI operated on using Internal Brace™ augmentation.

Methods: After IRB approval, a prospective study was conducted. Patients were included if they were older than 18 years, presented medial ankle pain and/or giving way, exhibited asymmetric flexible hindfoot valgus, failed conservative treatment, and had a positive MRI evaluated by an independent radiologist. Patients with less than six months of follow-up, stage IV flatfoot deformity, neuropathy and/or inflammatory arthritis were excluded from the study. CDLI diagnosis was confirmed intraoperatively with the arthroscopic ankle drive-through sign. Patients were evaluated preoperatively and postoperatively using foot and ankle ability measure (FAAM) score, 36-item short form survey (SF-36), and grade of satisfaction. Paired t-tests were used to assess the pre- and postoperative FAAM and SF-36 scores.

Results: Eleven patients met inclusion criteria. Nine patients were male and two female, with a mean age of 32 (18-61). Six ankles were right and five left. 88% presented with medial ankle pain, 67% medial drawer, 88% asymmetric hindfoot valgus, and 44% multidirectional ankle instability. No patient was lost to follow-up, with a mean follow-up time of 13.5 months (6-21). Preoperative FAAM and SF-36 scores improved from 58.7 to 75.3 and from 60.2 to 84.4 postoperatively, respectively ($p<0.05$). Two implant failures were observed, with no apparent compromise of construct stability. No patient was re-operated.

Conclusion: Our results suggest that deltoid ligament repair with Internal Brace™ augmentation in patients with CDLI is a reliable option with good functional outcomes and high satisfaction grade in short term follow-up.

Session 9- What's New in Foot and Ankle

New practical applications of artificial total talar prostheses

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Department of Orthopedic Surgery, Nara Medical University, Japan

Background: As an innovative technique for talar necrosis, we have devised an alumina ceramic artificial talus in 1999 and has indicated mainly focusing on the collapsed talus in elderly patients. Originally it was an implant of the talar body only. However, we changed its design to the whole body type in 2006, because there were several troubles on the

interface at the talar neck.

Indication and surgical procedure: It is mainly indicated for talar necrosis or talar fragile fracture. The latter also includes revision surgery after total ankle replacement. The artificial talus is made using the CT data of the healthy side. We use an anterior midline incision and the talus is cut into the coronal section from the anterior side. The talar body part of the artificial talus is firstly inserted and then made a plantar flexion position, the neck is easily redacted.

Results: We made a follow-up study for 55 tali in 51 patients with idiopathic osteonecrosis. Follow-up duration is 24 to 96 months with an average of 53 months. JSSF scores were improved from 43 to 89 points. There were no revision surgeries. Artificial talar replacement is a promising procedure, which is easy to operate and can preserve range of motion.

Future Prospects: Subsidence of the talar component of total ankle arthroplasty is a serious problem, but since the results of the revision procedure using the artificial talus are good. Therefore we are planning to expand the indication of the total talar prosthesis combined with total ankle replacement for rheumatoid arthritis and osteoarthritis.

Session 9- What's New in Foot and Ankle

What's new in Ankle Arthritis Outcomes: Lessons learned from a Canadian Outcomes Database

A. Younger

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The cohort has 1,104 procedures with minimum 2 years follow up.

Recent publications and presentations include:

1. Reoperation coding. It became apparent that there was no consistency in terminology for complications. To assist in determining outcomes a reoperation coding system was developed. This has been adapted by the editors of Foot and Ankle International to give some standardization to revision surgery for ankle joint replacement.
2. Suvivorship for 4 joint replacements have been determined with significant differences with the STAR outperforming the Mobility.
3. Arthroscopic ankle fusion outperforms open ankle fusion out to 8 years with less swelling, better outcome scores, shorter hospital stays and better satisfaction.
4. Ankle fusions have a lower repeat surgery rate than all ankle replacements. However the Hintegra revision rate for metal components is similar to the revision rate for ankle fusion (around 5% at an average of 6.3 years out).
5. Patients often prefer ankle replacements despite this with expectation, satisfaction and preference in bilateral cases being towards the joint replacement.
6. In hospital costs of ankle replacement is higher than ankle fusion for the primary procedure, but the cost of ankle replacement being similar to total hip replacement or total knee replacement.
7. A more detailed analysis of outcomes of ankle fusion and replacement for isolated ankle arthritis versus extensive hindfoot arthritis will be presented at this meeting.
8. Demographics. The patient demographics for end stage ankle arthritis, as well as the difference between patients receiving ankle fusion and replacement are described.

Session 10- Tendon-Ligament

Peroneal tendons pathology in ankle instability. An endoscopic point of view.

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Concomitant intra-articular and peri-articular pathology is common in chronic ankle instability with a potential to generate pain and dysfunction. Treatment of the associated pathology is essential for a better result, and exclusively open or arthroscopic isolated procedures, usually partially solve the ankle problem. In order to avoid aggressive open surgeries, combined anterior ankle arthroscopy, tendoscopy, hindfoot endoscopy, or any miniopen procedure should be considered.

Peroneal tendon pathology is frequently observed in chronic ankle instability. Synovitis, tendon rupture, intrasheath subluxation or a combination of them are the most common peroneal tendon problems related to chronic ankle instability. A controversial point is whether the secondary peroneal tendon problems must be treated when treating ankle instability. An individualized treatment plan is needed, and in the preoperative planning it is mandatory to know what concomitant peroneal tendon problems must be treated and what must not. Peroneal tendon endoscopy has been described to treat individualized peroneal tendon pathology. However, the combination of tendoscopy to treat peroneal tendon problems, and anterior ankle arthroscopy to treat chronic ankle instability has not been reported.

According to the author's experience, the aim of this presentation is to elucidate when tendoscopy of the peroneal tendons must be performed in patients with chronic ankle instability.

Session 10- Tendon-Ligament

State of the Art in Deltoid Ligament Injuries

G. Slullitel

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The deltoid ligament is primarily responsible for stabilizing the medial side of the ankle anteriorly and posteriorly, limiting talar abduction, and limiting hindfoot eversion. A minority of ankle injuries are medial sprains and these are often associated with complex injuries.

Currently diagnosis and treatment are still controversial and different strategies are available in order to assess and treat this disorder.

Anatomical discrepancies continue to exist, which contribute to a potential for under- and mis-diagnosis. Most often, the deltoid ligament will be treated conservatively or be allowed to heal on its own provided bone stabilization can be obtained. Surgery, however, is required for cases of chronic symptomatic instability or particularly complex fractures.

Standardization and continued research into the anatomical characteristics and most optimal surgical treatment strategies of the deltoid ligament are encouraged.

Session 10- Tendon-Ligament

Insertional Achilles tendinopathy – two different pathologies and the possibility for non-operative treatments

T. Kumai

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Background: Insertional Achilles tendinopathy (IAT) is clinical disorders characterized by the combination of posterior heel pain, swelling and impaired activity. The most common histopathological findings are degenerations at insertion site. However, clinical findings suggest the presence of more diffuse changes with involvement of the adjacent tissues. The precise indication of the conservative treatments for IAT has not yet clinically established.

The aim of the study is to demonstrate the detailed anatomy of the Achilles tendon insertion site which include adjacent bursa, adipose tissue (Kager's fat pad), superoposterior prominence of calcaneus and consider the possible application of non-operative treatments.

Methods: Samples of the entire length of the Achilles tendon insertion with adjacent tissue were removed from 10 dissecting room cadavers, with no evidence of systemic rheumatological disease and the tissue processed for routine histology. The Achilles tendon insertion was serially sectioned at 8 µm in the sagittal plane. The slides were stained with alcian blue, haematoxylin and eosin, Masson's trichrome, toluidine blue stain and observed under light microscope. Based on the histological findings, we tried ultrasound-guided a single injection of hyaluronic acid (HA) into retrocalcaneal bursa. The efficacy was assessed by visual analogue scale (VAS) score for pain and local symptoms (spontaneous pain, tenderness and pain on exercise) at baseline and at 1week after injection.

Results: Histological findings show a complex of adjacent fibrocartilages, bursa, fat pad and classical insertion site. Two different pathologies of compression and tensile damages were found depending on anatomical regions. The VAS score after injection of HA into bursa decreased in 80.0%. Local symptoms were also improved in 93.3%.

Conclusion: Achilles tendon insertion has two different pathologies due to regional variety. Although the study has some limitations (small sample size, lack of a control group), HA injection into retrocalcaneal bursa can become a possible treatment for patients with insertional Achilles tendinopathy.

Session 10- Tendon-Ligament

Evolution to MIS for Ankle Stabilization: A comprehensive international approach using the principals of Anatomy, Biomechanics and Evidence based medicine?

M. Glazebrook

Professor of Surgery Dalhousie University, Halifax, Nova Scotia, Canada

Chronic ankle instability (CAI) is a common problem that requires surgical treatment to relieve pain and improve function. Traditionally, open surgical procedures have been described for surgical management of CAI including direct repair as well as a variety of reconstruction techniques. Recently there has been an evolution of Minimally Invasive Surgery (MIS) to improve open surgical procedures for treatment of CAI to improve patient outcomes (1).

A collaboration of international Foot & Ankle Orthopedic surgeons from Japan, France, USA and Canada (Dalhousie Foot & Ankle Orthopedics) has established 3 new MIS techniques (2-4) which are focused on anatomic repair & reconstruction of the lateral ligaments of the to treat CAI and improve patient outcomes. The study of the precise anatomy for these MIS surgeries have been established in recent cadaveric studies in Barcelona Spain (5-6).

Further, these surgical procedures are currently being performed on humans and being studied in the International Multicenter Prospective Ankle Study Database on Safety and Efficacy Outcomes of Surgical Stabilization (IMPASS EOSS) study ethics approved and centralized at Dalhousie University.

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Session 11- Cartilage Repair

Osteochondral lesions of the talus: What is the problem and solution?

J. W. Lee

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The pathologic entity involving articular cartilage and underlying bone was first introduced by Konig. Then, the same disease entity but different location at the ankle was described by Kappis. Although several authors have used different terms for the same pathology, the term osteochondral lesions of the talus (OLT) is currently accepted one. Most of the OLT patients present with ankle pain during weight bearing and have a history of trauma such as inversion injury. Advanced modern imaging technique such as high resolution CT and MRI aid better detection of the lesions which are not visible in plain radiographs. For patients who were refractory to conservative treatment, variety of surgical technique has been introduced. Treatment options are generally categorized into reparative (e.g. curettage, drilling and microfracture) and restorative (e.g. OATs, osteochondral allograft, and particulated juvenile cartilage allograft) techniques. Based on bone marrow stimulation technique, there have been many successful outcomes after treatment of OLT. The selection of the most appropriate treatment option should be based on the specifics of a talar lesion, in particular, lesion size. The treatment of symptomatic

osteochondral lesions of the talus (OLT) has difficulties and limitations caused by the poor regeneration of articular cartilage and the limited access to the ankle joint. It is important that the surgeon understand the causes of failure as well as the factors influencing the results of arthroscopic treatment of OLTs. The presence of such a risk factor may encourage surgeons to find new treatment strategies as well as counsel patients differently.

Session 11- Cartilage Repair

Microfracture for osteochondral lesions of the talus-is it still the gold standard for treatment?

J. McCormick

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Osteochondral lesions of the talus (OLT) can occur in a large number of patients suffering an acute ankle sprain. While many of these lesions heal and become asymptomatic, a subset of patients fail conservative treatment and require surgery. Generally accepted treatment for OLTs has been arthroscopic debridement with microfracture of the osteochondral defect. Several studies have suggested excellent outcomes with this method of treatment. While some studies have investigated outcomes dependent on qualities of the lesion (size, cyst formation, etc), many surgeons still advocate debridement and microfracture as a first line treatment, regardless of the size, depth, or location of the lesion.

With increased availability of biologic adjuvants, there has been growing interest in alternative strategies for treatment of OLTs. This has driven some debate with varying opinions on best practice. Recently, there has been greater consideration given to the use of biologic adjuvants as first line treatment for OLTs. In this discussion, we will review current management strategies for OLTs and investigate whether debridement and microfracture alone can still be considered the optimal method of treatment.

Session 11- Cartilage Repair

Osteochondral Lesions Treated with Cancellous Bone Grafting and Periosteal Flap. My Experience.

S. Guerrero

Bogotá, Colombia

Big osteochondral lesions have been historically a challenge of treatment. They represent a high percentage of persistent pain and defect recurrence after ankle arthroscopy and microfractures. The treatment of these lesions with cancellous bone grafting and periosteal flap has been well documented in the literature as a successful revision procedure for those patients who did not have good results after primary surgery. Being these big osteochondral lesions (>150 mm^2) the most likely to fail, we decided to treat them with cancellous bone grafting and periosteal flap as the primary procedure. We present our experience with 14 patients and a four year follow up.

The 14 patients were evaluated prior and after surgery with the AOFAS scale, having an average improvement of 35 points. The group showed no recurrence of the lesions during the four year follow up. Since most of these lesions occur in a young and physically active population, we consider that any effort towards the prevention of ankle arthritis should be encouraged.

Session 11- Cartilage Repair

AMIC surgery for osteochondral lesions of the talus

V. Valderrabano

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Osteochondral lesions (OCL) of the ankle are majorly located on the talus (OCLT) and seen mostly in sports orthopaedics (1). OCLT are commonly associated with ankle ligament instability and pes planovalgus.

The Autologous Matrix-Induced Chondrogenesis (AMIC) procedure is a meanwhile common surgical treatment of OCLT consisting of debridement and microfracturing, bone defect filling with autologous bone graft, and sealing of the area with a collagen matrix (Chondro-Gide, Geistlich Pharma AG, Wolhusen, Switzerland). Valderrabano et al. described their experience with 26 cases of OCLT with a mean size of 1.7cm^3 (1). At mean followup of 31 months (range, 24-83) the patients showed an improved AOFAS hindfoot scale from 60 to 89 points and a decrease in VAS from 5 to 1.6 points. Wiewiorski et al. showed that patients undergoing AMIC could reach a sports activity postoperatively.

The advantages of the AMIC procedure are the off-the shelf availability of the matrix, a one-step procedure, and only slightly higher costs then microfracturing alone.

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Session 12- Ankle-Joint Preserving Measures

Osteotomies around the ankle, principles and planning

E. Wagner

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Since there is no one simple solution for every ankle arthritis case, supramalleolar or calcaneal osteotomies have appeared as another option to consider, specifically when the cartilage degeneration is localized in order to avoid or at least delay the end of the line options that exist, i.e. ankle arthroplasty and arthrodesis. Young and active patients, where a localized arthrosis is found, who are willing to try an ankle preserving surgery are the best candidates for this approach. As trauma is the most common reason for ankle arthritis, localized arthritis inside the ankle joint can be found. As the anterolateral aspect of the pilon is the weakest, valgus intraarticular deformity is found. In cases of varus intraarticular deformities, which are most frequently found in long standing cavovarus feet, medial sided arthrosis is found. Anterior or posterior ankle arthrosis are additional alternatives to be found, and far more difficult to treat. Periarticular osteotomies have been advocated in these type of arthrosis, as they redistribute joint load from areas of cartilage degeneration to healthy areas of cartilage, hopefully decreasing pain. Supramalleolar osteotomies will shift the weight bearing axis depending on the resulting joint orientation, therefore unloading certain areas inside the ankle. Medializing or lateralizing calcaneal osteotomies will additionally shift the

weight bearing axis medially or laterally correspondingly, achieving more unloading effect. Careful preoperative planning, considering the weight bearing axis location in the coronal and sagittal plane and subtalar joint motion, allows to plan isolated supramalleolar osteotomies or combined supramalleolar and calcaneal osteotomies in order to treat these challenging cases.

Session 12- Ankle-Joint Preserving Measures

Effect of Osteotomies around the Ankle

B. Hintermann

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Joint-preserving treatments aim to reduce symptoms and to diminish harmful influences on the joint mechanics to halt the degenerative process.

Reconstructive surgery including osteotomies and soft tissue reconstruction has gained recent interest for treatment of the osteoarthritic ankle. The specific aim of these surgeries has been to redistribute the mechanical axis to change the loads on the joint. In general, they address ankle osteoarthritis or deformity at or above the level of the ankle joint using supramalleolar osteotomies and soft tissue procedures, or below the joint using osteotomies of calcaneus and midfoot.

Our results of the last years have shown that osteotomies above and beneath the ankle joint are able to correct deformities and incongruency at the tibiotalar joint over years, thus avoiding further cartilage wear. In some instances, the tibiotalar joint has become a regular joint space back, which can be explained as potential regeneration of cartilage. Beside of some few cases (<10%), arthrodesis or total ankle replacement have been successfully avoided. This benefit is even more important, as mostly younger and active patients are concerned and long-term results after arthrodesis and total ankle replacement are still critical.

Supramalleolar osteotomies are effective for the treatment of early and midstage asymmetric osteoarthritis of the ankle joint. Normalization of load transfer diminishes degeneration and thereby may postpone fusion or joint replacement surgery.

Session 12- Ankle-Joint Preserving Measures

Ankle Joint Preserving Measures

W. C. Lee

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Current joint preserving measures for varus and valgus ankle arthritis would be reviewed, then my approach for varus and valgus arthritis would be presented.

Correction of the coronal plane deformity is the object of surgery both in varus and valgus arthritis. Correction at the distal tibia is the mainstay of the joint preservation surgery for varus ankle osteoarthritis, while correction of the foot deformity and deltoid ligament reconstruction has been tried for valgus ankle arthritis.

Distal tibial osteotomies has been reported as a useful method to delay ankle arthrodesis or total ankle arthroplasty, however correction of the talar tilt could not be achieved in ankles with large talar tilt. No clinical reports of successful joint preservation for valgus arthritis with large talar tilt could be found in English literature. Three dimensional change in varus ankle arthritis shows anterior displacement or internal rotation in axial plane in many ankles. Often posterior displacement can be found in valgus ankle arthritis. Therefore current method aiming at the correction of coronal plane deformity may have inherent limitation of its ability to correct the talar tilt.

I have tried three dimensional correction, which means restoration of the correct talus position in the ankle mortise either by tendon transfer or triple arthrodesis in addition to the conventional bony realignment surgery if necessary. I believe the longevity of the ankle joint preserving surgery depends on the successful decrease of the talar tilt to the normal range.

Session 12- Ankle-Joint Preserving Measures

Ankle Distraction: How to Succeed

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Ankle distraction arthroplasty is a component of ankle joint preservation for arthritis. Joint preservation generally includes correction of associated bony and soft tissue deformities, joint debridement, and ligament and tendon balancing. Distraction arthroplasty is based on the hypothesis that articular cartilage repair can occur when the joint is unloaded and subjected to intermittent fluid pressure changes. Mechanical unloading is achieved for several months with a ring external fixator device. During this period, loading and unloading of the joint during weight-bearing results in intra-articular hydrostatic pressure changes. In vitro and animal studies have demonstrated that mechanical unloading and intermittent fluid pressure changes can alter cartilage matrix turnover. Also, subchondral bone remodeling occurs with distraction and may affect cartilage repair. Subchondral bone remodeling has been linked to clinical improvement. Clinical studies have demonstrated improved pain and mobility, with a delay for the need of ankle arthrodesis or replacement.

Optimizing success with ankle distraction is important as the process of the procedure and recovery period can be demanding for the patient and physician. There are multiple factors that may improve outcomes, including patient selection, surgical technique, post-op management, post-frame removal care, and surgeon expertise with ring external fixation techniques.

Optimal patient characteristics include patients with post-traumatic arthritis, joint mobility, low preoperative pain levels, symmetric joint wear without equinus deformity, and correctable bony deformity. Female patients with high pre-distraction pain levels, anteriorly worn joint, joint ankylosis (particularly in equinus), and physically demanding occupations may lead to less satisfactory outcomes.

Technical factors are optimized with surgeon expertise, and include applying a stable frame that minimizes pin and wire inflammation/infection, and allows patients to comfortably weight bear. Gradual distraction is better tolerated than acute distraction, and six mm of distraction allow joint surfaces to remain apart during ambulation. Proper ankle joint hinge alignment will allow for maximum in-frame motion, which may lead to lower arthrodesis rates. Achieving anatomic alignment of foot and/or tibial deformity while maintaining joint stability is ideal, and this may include gradual and/or acute corrections with ligament balancing. A surgeon's ability to achieve these technical factors will be improved with experience, as well as focused training in ring external fixation methods. This may include professional coaching and surgical simulation.

Post-operative management includes routine pin and wire care, range of motion exercises, comfortable weight bearing with a proper walking platform attached to the foot ring, and appropriate ankle distraction with maintenance of hindfoot joint alignment. Hinge position and other frame componentry may change during treatment, which can require adjustment.

Frame time is generally three months, but may be longer when tibial deformity correction is performed. In these cases, prolonged foot frame time (greater than four months) may lead to ankle stiffness, and foot discomfort. After frame removal can be difficult for the patient due to discomfort around the ankle joint, and full recovery may take one to two years. Non-impact activities including swimming, other water exercises, biking, strengthening, and stretching are beneficial. A gradual return to walking without assistive devices can take several months, and may be aided with the use of a custom short-articulating ankle foot orthosis. The first year following frame removal can be challenging for the surgeon to create individual programs for patients to succeed with the procedure.

FREE PAPER ABSTRACTS

IFFAS ABSTRACTS ARE AVAILABLE ON FOOT AND ANKLE SURGERY ONLINE MEETING SUPPLEMENT

Abstracts of Free Papers presented at 6th IFFAS Triennial Meeting, 29-30 September 2017, Lisbon, Portugal
Presentation Title/Presenting Author in order of appearance in the programme

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2 Assessment of Haglund's syndromes with a new radiologic measure	Y. Tourné
3 Forefoot surgery in depressed patients: To operate or not to operate?	J. Amestoy
4 A Comparative Study of Modified Mitchell's and Scarf Osteotomies for Moderate Hallux Valgus	B. Lau
5 The Use of 3D Prints to Compare the Efficacy of Different Calcaneal Osteotomies for Heel Varus	G. Pfeffer

SESSION 2 Obtaining and Maintaining a Stable Syndesmosis

6 Weightbearing Versus Gravity Stress Radiographs For Stability Evaluation Of SER Fractures Of The Ankle	A. Seidel
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SESSION 9 What's New in Foot and Ankle

41 Oxford Foot Model and weight bearing CT (pedCAT):Comparison of tibia-hindfoot angle and arch height	M.R. Wachowsky
42 Combination of PedCAT with Pedography Shows Relationship of Foot Center and Center of Gravity	M. Richter
43 Flatfoot Hindfoot Alignment: A Comparison of Clinical Assessment and Weightbearing ConeBeam CT	C. de Cesar Netto
44 The Use of Weight-Bearing CT Scan in the Evaluation of Hindfoot Alignment	M. Welck
45 Weightbearing CT in normal hindfoot alignment; Presence of a constitutional valgus?	A. Burssens

SESSION 10 Tendon -Ligament

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47 Optimization of Tenocyte Lineage-Related Factors from Tonsil-Derived Mesenchymal Stem Cells using Design of Experiments	S.S. Kwon
48 Biomechanical comparison of circumtibial and transmembranous posterior tibial tendon transfer	P. Wagner
49 Achilles tendinopathy induced by serial injections of collagenase: a new experimental model	C.de Cesar Netto
50 Therapeutic potential of Mesenchymal Stem Cells to treat Achilles Tendon Injuries	M.H.-Costa Vieira

SESSION 11 Cartilage Repair

51 Anatomic feature of deltoid ligament attachment in posteromedial osteochondral lesion of talar dome	T. Nakasa
52 Matrix-Associated Stem Cell Transplantation (MAST) in Chondral Defects of the Ankle is Safe and Effective	M. Richter
53 Primary versus Secondary Osteochondral Autograft Transplantation in Patients with Large Sized OLTs	K.H. Park
54 Magnetic Resonance T1rho Mapping of Articular Cartilage Grafts After Autologous Osteochondral Transplantation for Osteochondral Lesions of the Talus: A Longitudinal Evaluation	N.Haraguchi
55 Evaluation of reproducibility of the Magnetic Resonance Observation of Cartilage Repair Tissue MOCART	A. Bianchi

SESSION 12 Ankle-Joint Preserving Measures

56 Antinociceptive effect of hyaluronic acid sodium on ankle osteoarthritis model	S. Jimbo
57 Preoperative Patient-reported Outcome Measures Predict Success in Patients with Ankle Arthritis	F. Waly
58 Relationship between Isokinetic Muscle Strength and Functional Test in Chronic Ankle Instability	Y.H. Park
59 Weightbearing CT analysis of chronic lateral ankle instability : a multivariate study of 124 feet	F. Lintz
60 Weight-Bearing Computed Tomography Findings in Varus Ankle Osteoarthritis: Abnormal Internal Rotation of the Talus in Axial Plane	M.H. Kim

SESSION 13 Free Papers

61 Polymorphisms of estrogen receptors in menopausal women with posterior tibial tendon dysfunction	P.A. Pontin
62 Conservative Treatment For Plantar Fasciitis: A Prospective Randomized Study Among Three Methods	C. Jasmin
63 Randomized control study of toe exercise for prevention from fall in elderly people	K. Amaha
64 Novel concept for preserving severe valgus ankle osteoarthritis with large talar tilt: Realignment of the foot with triple arthrodesis	M.H.Kim
65 Which surgical treatment is better for plantar fasciitis? A randomized controlled trial	C. Gamba
66 Minimal important change, measurement error and responsiveness for the SEFAS	M. Cöster
67 Defining Gastrocnemius Tightness-A study on 400 participants without foot and ankle pathology	O. Chan
68 Changes in the ankle joint and hindfoot alignment following varus deformity correction of the knee	B.O. Jeong
69 Evaluation of rotation of first metatarsus with hallux valgus by computed tomography	Y. Nakamoto
70 Intramedullary plate fixation in hallux valgus	S. Mugrabi

SESSION 14 Free Papers

71 Phenol Injection For Morton's Neuroma Under Elettroneurographic Guidance	B. Magnan
72 Repeatability of a multi-segment foot model with a 15-marker set in healthy children	E.J. Kim
73 Translation, cultural adaptation and validation of the Foot Function Index-revised (FFI-R)	K. Stéfani
74 Efficacy of dermal fenestration technique on soft tissues in distal tibia and fibula fractures	U. Akgun
75 Minimum 10;19 Years; Follow-Up of the Star Total Ankle Perform in the USA	J. Nunley
76 Deltoid ligament injury patterns in external rotation ankle injuries, a cadaveric study	M. Cooper
77 Clinical Outcome for Total Ankle Replacement in Patients Younger Than 50 Years	D. Spuehler
78 Medializing Calcaneal Osteotomy (MCO) For Acquired Adult Flatfoot	E. Samaila
79 Percentage of articular surface debridement is equivalent in arthroscopic and open ankle fusions	M. Anderson
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74.00	Minimal Clinically Important Differences for AOFAS score in Hallux Valgus Surgery	H.Y.	Chan
75.00	Diabetic neuropathic foot ulcer: metatarsal osteotomy for surgical off-loading	L.	Suhodolcan
76.00	Bioactive glass S53P4 in treatment of osteomyelitis: A report of 6 clinical cases.	S.	Ordoñez
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78.00	Tibiotalocalcaneal Arthrodesis with a Retrograde Triple Bending Nail - Results of the First 200 Cases	M.	Richter
80.00	Arthroscopic ganglionectomy of a toe with color-aided visualization of the ganglion stalk.	T.	Ogawa
81.00	The Use of Antibiotic Beads as Adjuvant Therapy for Limb Salvage in Foot and Ankle Infection	C.	de Cesar Netto
83.00	Hindfoot Alignment in Flatfoot Deformity: A Comparison between Clinical and WBCT Examinations	C.	de Cesar Netto
84.00	Calcaneus Fracture and Psychiatric Illness or Use of Psychotropic Medication	C.	Janney
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96.00	Subtalar fusion for coalition- an indication for medical approach?	H.Y.	Kurup
97.00	Change of density distribution in talar subchondral bone plate after Weber B fractures-	C.	Deml
100.00	Bone-Tendon Autograft In Insertional Achilles Tendinopathy	R.	Hart
101.00	Compression Staple In The Treatment of Jones Fractures	R.	Hart
102.00	Does The Foot Loading Change After The Distal Metatarsal Osteotomy In Hallux Valgus Surgery?	R.	Hart
103.00	Use of the reverse Coleman block test for early diagnosis of the medial foot column insufficiency	R.	Hart
104.00	Tendoscopic versus Open Modified Das De Procedure for Recurrent Peroneal Tendon Dislocation	A.	Nishimura
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106.00	Comparison Of The Outcomes Between two techniques, in fifth metatarsal base fracture	J.	KIM
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138.00	The Scandanavian Total Ankle Replacement;: Patient outcomes at 15 year follow-up	A.	Palanca
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147.00	Total Ankle Replacement in Patients with Haemophilic Arthropathy	A.	Barg
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149.00	Single-Surgeon Experience with Supramalleolar Osteotomy: Can Tibiotalar Tilt Be Corrected?	A.	Barg
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151.00	Primary Open vs. Arthroscopic Ankle Arthrodesis: Comparison of Fusion and Complication Rates	A.	Barg
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284.00	3D Computational Position Analysis based on the Articular Surface of Tarsal Bone:Preliminary Study	E.J.	Kim
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291.00	Outcome of Operative Treatment for Diabetic Midfoot Charcot Neuroarthropathy	M.	Noguchi
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303.00	The use of dynamic ultrasound examination in high sprain diagnosis.	E.	Lopez Capdevila
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310.00	Non-radiographic Measurement of Hallux Valgus Angle using Self-photography	S.	Yamaguchi
311.00	Treatment of 2nd stage posterior tibial tendon deficiency (PTTD)	M.	Napiontek
312.00	Correlation hallux valgus and flat foot by random sampling by Japanese rural area residents	N.	Sakai
313.00	The Role of the Cavus Foot in Peroneal Tendon Pathology	A.	Taniguchi
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329.00	Mitchell osteotomy for moderate to severe hallux valgus deformity	P.J.	Huang
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340.00	Lateral Approach for the Displaced Sustentacular Fragment in Intra-Articular Calcaneal Fractures	K.	Tsunoda
342.00	Clinical and radiological outcomes after Weil osteotomy and distal metatarsal metaphyseal osteotomy	M.	Thomas
343.00	Comparing outcomes of 1st metatarsophalangeal joint arthrodesis using open and minimally invasive technique	D.	Kishore Kumar
344.00	Clinical and radiological outcomes of correction of hallux valgus without distal lateral soft tissue	D.	Kishore Kumar
346.00	Demographic characteristic of patients who underwent hallux valgus surgery in a private clinic in Europe	I.	Zwinczewski
347.00	Open Reduction and Internal Fixation for Secondary Ossification Center of the Medial Malleolus	M.	Taki
349.00	Relationship between ankle arthroscopic findings of the lateral malleolus and the ATFL attachment	A.	Teramoto
351.00	Determinants of Short Term Patient Satisfaction After Ankle Arthrodesis Surgery	A.	Primadhi
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356.00	Anterior Inferior Tibiofibular Ligament Augmentation for Syndesmosis Injury: A Cadaveric Study	H.	Shoji
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373.00	Long-term results after surgical treatment of Hallux Rigidus using HemiCAP®	I.	Nomjuweit
374.00	Accuracy of Implant Positioning after Conventional Mobile-Bearing Total Ankle Arthroplasty	G,W,	Lee
375.00	Comparison of bone tunnel and suture anchor techniques in the modified Broström procedure for chron	M.C.	Kim
376.00	Effect of Incomplete Sesamoid Reduction on the Outcomes of Proximal Chevron Osteotomy for Moderate to Severe Hallux Valgus Deformity	M.C.	Kim
377.00	Comparison of distal soft-tissue procedures combined with a distal chevron osteotomy for moderate to severe hallux valgus: first web-space versus transarticular approach	K.B.	Lee
378.00	Comparison of outcomes between proximal and distal chevron osteotomy, both with supplementary later	G.W.	Lee
379.00	Comparison of Outcomes of Total Ankle Arthroplasty for Osteoarthritis with Moderate and Severe Varus Malalignment Compared with Neutral Alignment	K.B.	Lee
380.00	Neurologic injuries after primary total ankle arthroplasty: prevalence and effect on outcomes	M.C.	Kim
381.00	Modified Broström Procedure for Chronic Lateral Ankle Instability in Patients With Generalized Joint Laxity	K.B.	Lee
382.00	Comparison of chondral versus osteochondral lesions of the talus after arthroscopic microfracture	G.W.	Lee
383.00	Comparison of the Modified Broström Procedure for Chronic Lateral Ankle Instability With and Without Subfibular Ossicle	G.W.	Lee
386.00	Comparison of Arthroscopic versus Fluoroscopic Assisted Syndesmotic Screw Fixation for Distal Tibiofibular Syndesmosis Injury	M.C.	Kim
390.00	PIP resection arthroplasty vs PIP arthrodesis for fixed hammertoe deformity correction. A review.	M.C.H.W.	Fuchs
391.00	Indications for supramalleolar osteotomy based on arthroscopic findings for varus ankle arthritis	N.	Hio
393.00	Management of neglected Lisfranc Injury of foot -a tertiary referral centre experience	J.	Dhaliwal
394.00	Calcaneal lengthening osteotomy in talocalcanel tarsal coalition	M.	Napiontek
395.00	Trends and predictions of outcomes after ankle arthrodesis: a nationwide population-based study	Y.M.	Cheng
397.00	Is mechanical correction of the foot and ankle important for healing the diabetic foot ulcer?	H.	El-Mowafi
398.00	One approach for treatment of calcaneal malunion	H.	El-Mowafi
399.00	Informative of the ulrtasound for Morton's neuroma diagnostics	M.	Shinkareva
400.00	Intra-operative evaluation of distal articular angle of the first metatarsal (DMAA)	C.	Jasmin
402.00	The Lateral Malleolar Bony fleck classified by Size and Pathoanatomy	J.	Wong-Chung
403.00	Novel Cost-Effective Technique: Surgical Modification In Chronic Lateral Ankle Instability	I.	Sarhan
404.00	Patient reported disability of ankle, hindfoot, midfoot and hallux metatarsophalangeal arthritis	M.	Christian
406.00	The Salto Total Ankle Arthroplasty; Clinical and radiological outcomes at five years	K.	Koo
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