

# 16<sup>th</sup> International Conference on Orthopaedics, Arthroplasty and Arthroscopy

June 29, 2023 | Webinar

## Scientific Tracks & Abstracts



# Sessions

Orthopaedics Surgery | Arthroplasty | Medicine and Surgery

**Session Chair: Angela Munoz Navarro**

Bedford Medical Centre | Ireland

## Session Introduction

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**Title: Acetabular medical wall bone stock quantification during developmental dysplasia of the hip**

**Elena Kovbasa** | Kharkiv Institute of Medicine and Biomedical Sciences | Ukraine

**Title: The Evolution of robotic surgery in hip arthroplasty**

**Hatim ALShareef** | King Fahad Armed Forces Hospital-Jeddah K S A | Saudi Arabia

**Title: A study to compare the effects of cranio-cervical flexion exercises and scapular stabilization exercises on pain, disability and scapular dyskinesia among patients with chronic mechanical neck pain**

**Loveneet Kaur** | Baba Farid University of Health Sciences Faridkot | India

**Title: THR preplanning during DDH: focus on acetabular spongious bone quality**

**Elena Kovbasa** | Kharkiv Institute of Medicine and Biomedical Sciences | Ukraine

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## Dorsal bridge plate fixation for lisfranc fracture dislocations

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**Background:** Traditionally, the benchmark of treatment of Lisfranc fracture dislocations has been open reduction and internal fixation (ORIF) with transarticular screws. Recently, however, there has been a trend towards the use of dorsal bridge plating in an attempt to avoid additional damage to the joint from screw penetration. Objectives: To analyse the functional and radiological outcomes of bridge plating.

**Study Design & Methods:** We retrospectively evaluated the clinical outcomes of patients with acute Lisfranc joint injury who had been treated by ORIF with a dorsal bridge plate from 2014 to 2021 at our Department of Traumatology and Orthopaedics. Patients with a follow up of less than 12 months were excluded. The outcomes were evaluated using the midfoot scores of American Orthopedic Foot and Ankle Society (AOFAS) at the last follow up. The anatomical reduction (alignment, length, and Lisfranc interval diastasis) was assessed on postoperative images using the Wilppula classification of good, fair, or poor.

**Results:** Eighteen patients, 15 men and 3 women, aged from 20 to 71 years (average 34 years) and a mean follow up of 30 months were analysed. They all underwent plate extraction between 4 and 5 months (average 4.2). The mean AOFAS score was 92. We achieved good or anatomical reduction in all patients. One patient (5.6%) had a screw pull out and 1 patient (5.6%) had a Sudeck syndrome.

**Conclusions:** While debate continues about the best method of fixation, there is, however, a consensus that the anatomical, stable reduction of a Lisfranc injury is a prerequisite for a good outcome. ORIF with a bridge plate can lead to rigid stability, precise reduction and good clinical outcomes.

### Recent Publications:

1. A Rare Case of Acute Simultaneous Bilateral Quadriceps Tendon Rupture - From Diagnosis to Treatment and Review of the Literature
2. A minimally invasive sinus tarsi approach with percutaneous plate and screw fixation for intra-articular calcaneal fractures - Our gold standard.
3. Percutaneous transforaminal endoscopic discectomy and debridement for the treatment of spondylodiscitis: a case report.

### Biography

Jose Machado is a resident of Traumatology and Orthopaedics with a vast interest in foot and ankle pathology.

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## Acetabular medical wall bone stock quantification during developmental dysplasia of the hip

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**Statement of the Problem:** Implantation of the cup above or laterally to the level of the hip biomechanical center is considered to be a risk factor for the acetabular component's instability, so its implantation in the projection of the true acetabulum is desired but accompanied with risk of medial wall perforation and neurovascular complications. Thus precise quantitative assessment of medial wall bone stock in site of the planned acetabular component's bony bed during DDH is required.

**Methodology & theoretical orientation:** There were revealed a complex comparative MSCT-morphometric investigation of 32 normal hips and 65 hips with DDH Crowe I-III types. There were assessed medial wall bone width in projection of the lig. teres bed and planned acetabular component's bony bed centre according to the proposed MSCT-measuring technique; their correlation with indices of femoral head's cranial migration, acetabular horizontal sphericity angle and centre-edge (Viberg's) angle. Mann-Whitney test, one-way analysis of variance and Spearman's rank correlation were used respectively.

**Findings:** Width of the acetabular medial wall in projection of the lig. teres / acetabular component's bony bed centre was defined as: 4,3 mm (3,3; 4,8) / 7,2 mm (6,2; 7,8) for normal hips, 9,95 mm (7,5; 11,6) / 11,85 mm (9,8; 13,5) for Crowe I hips, 15 mm [(1,7; 17,3) / 15,7 mm (13,5; 17,3) for Crowe II hips and 15,45 mm (13,7; 19,8) / 16,05 mm (12,8; 20,2) for Crowe III hips, respectively. Weak correlation of acetabular medial wall bone stock in projection of acetabular component's bony bed centre with femoral head's cranial migration indicates the invalidity of the Crowe's DDH staging for THR's needs and the necessity of independent measuring of the index during individual preoperative planning.

**Conclusion & Significance:** Positioning of the cup at the level of the hip's biomechanical centre requires its medialisation that can be achieved safely only with medial wall width not less than 12-15 mm in both localisations, otherwise it should be turned to cotyproplasty technique. Since conventional biplanar X-ray imaging is invalid for precise measuring of the aforementioned indices due to superimpositioning, the proposed MSCT-morphometric technique could be of help in terms of individual safe implantation technique selection during THR preplanning for DDH.

### Recent Publications:

1. Acetabuloplasty at the anatomic centre for treating Crowe class III and IV developmental hip dysplasia: a case series / C. Sen, K. Bilsel, M. Elmadag [et al.] // Hip. Int. - 2016. - Vol.26. - P.360-366.
2. Dorr L.D. Medial protrusion technique for placement of a porous-coated hemispherical acetabular component without cement in a total hip arthroplasty in patients who have acetabular dysplasia / L.D. Dorr, S. Jakakkol, M. Moorthy // J. Bone Joint Surg. Am. - 1999. - Vol.81. - P.83-92.
3. Evaluation of medial acetabular wall bone stock in patients with developmental dysplasia of the hip using a helical computed tomography multiplanar reconstruction technique / R. Y. Liu, K. Z. Wang, C. S. Wang, X. Q. Dang [et al.] // Acta Radiologica. - 2009. - Vol. 50, N 7. - P. 791-797.

### Biography

Elena Kovbasa has obtained her PhD degree at the age of 29 years in Dnipro State Medical University, Ukraine. Her PhD thesis was dedicated to implantation characteristics of acetabulum implicated to THR during developmental dysplasia of the hip. After that she had been working as an Assistant Professor of Trauma and Orthopaedics Department of Dnipro State Medical University, Ukraine since 2019. Since 2023 she's Head of the Department of Clinical Sciences of Kharkiv Institute of Medicine and Biomedical Sciences. The main field of scientific search is preoperative planning for THR in various hip joint pathologies and postural balance restoring after THR during DDH. She has over 40 publications and international conferences reports, those have been cited over 30 times, and her publication h-index is 2.5.

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### The evolution of robotic surgery in hip arthroplasty

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Robotic surgery has emerged as a revolutionary technology in the field of orthopedics, offering new possibilities for improving the outcomes of hip arthroplasty. This abstract aims to provide an update on the advancements in robotic options for hip arthroplasty, focusing on the active, semi-active, and passive types of robotics used in this surgical procedure. Furthermore, the advantages and disadvantages of robotic hip replacement surgery, along with an assessment of the learning curve and cost-effectiveness of implementing this technology. Finally, an appraisal of the existing literature discussing the outcomes of robotic hip replacement surgery will be provided.

Robotic-assisted technology in hip arthroplasty offers several benefits. Active robotic systems utilize real-time feedback mechanisms, enabling surgeons to precisely plan and execute the procedure. Semi-active systems provide assistance to enhancing precision and reducing the risk of errors. Passive robotic systems act as guides, allowing surgeons to follow preoperative plans. Each type of robotic system presents unique advantages, such as improved implant positioning, enhanced surgical accuracy, and reduced soft tissue damage. As surgeons gain experience, procedure times decrease, and outcomes improve. While initial costs may be higher, the potential for reduced revision rates and improved patient outcomes could contribute to long-term cost savings. Studies reported improved implant positioning and reduced dislocation rates when robotic technology is utilized.

In conclusion, the evolution of robotic surgery in hip arthroplasty has introduced innovative options for surgeons. The active, semi-active, and passive robotic systems offer distinct advantages and disadvantages, impacting surgical precision and patient outcomes. While the learning curve and cost-effectiveness are important considerations, the existing literature demonstrates promising results in terms of improved implant positioning and functional outcomes. Continued research and advancements in robotic technology will contribute to further optimizing the benefits of robotic hip replacement surgery.

#### References

1. HM Alshareef (2023) Pediatric Mid-Shaft Humerus Fracture Treated with Nancy Nails Whilst on Growth Hormone- A Case Report.
2. HM Alshareef (2023) Robotic Surgery In Total Knee Replacement Surgery: Current Scenario And Future Perspective
3. HM Alshareef (2021) Medial Epicondyle Fracture with Ulnar Nerve Entrapment Medial Epicondyle Fracture with Ulnar Nerve Entrapment EC Orthopedic Journal.

#### Biography

Hatim ALShareef is a highly skilled Consultant Orthopedic Trauma Surgeon specializing in Sports Medicine and Arthroscopic Surgery. He is also experienced in Arthroplasty and Lower Limb Reconstruction Surgery. He completed a fellowship in Arthroplasty and Lower Limb Reconstruction Surgery at the University of Toronto, where he gained extensive knowledge and expertise in this field. Currently, He is working as an Orthopedic Consultant at King Fahad Armed Forces Hospital in Jeddah, Saudi Arabia. He is dedicated to providing high-quality orthopedic care, particularly in the areas of sports medicine, arthroscopy, arthroplasty, and lower limb reconstruction surgery. His commitment to patient well-being, medical education, and research makes him a valuable asset to the field of orthopedics.

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## **A study to compare the effects of cranio-cervical flexion exercises and scapular stabilization exercises on pain, disability and scapular dyskinesia among patients with chronic mechanical neck pain**

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**Introduction:** Osteoarthritis (OA) is one of the leading causes of disability, and the knee is the most commonly affected joint in the body. The last resort for treatment of knee OA is Total Knee Replacement (TKR) surgery. Despite numerous advances in prosthetic design, patients do not reach normal function after surgery. Current surgical decisions are made on 2D radiographs and patient interviews. **Aims:** The aim of this study was to compare knee kinematics pre and post TKR surgery using computer animated images of patient specific models under every day conditions.

**Methods:** 7 subjects were recruited for the study. Subjects underwent 3D gait analysis during 4 every day activities, and medical imaging of the knee joint pre and one month post-surgery. A 3D model was created from each of the scans, and the kinematic gait analysis data was used to animate the images. **Results:** Improvements were seen in range of motion in all 4 activities 1 year post surgery. The preoperative 3D images provide detailed information on the anatomy of the osteoarthritic knee. The postoperative images demonstrate potential future problems associated with the implant. Although not accurate enough to be of clinical use, the animated data can provide a valuable insight into what conditions cause damage to both the osteoarthritic and prosthetic knee joint. As the animated data does not require specialist training to view, the images can be utilised across the fields of health professionals and manufacturing in the assessment and treatment of patients pre and post knee replacement surgery. Future improvements in the collection and processing of data may yield clinically useful data.

**Conclusion:** Although not yet of clinical use, the potential application of 3D animations of the knee joint pre and post-surgery is widespread.

### **Biography**

Loveneet kaur is working as a department of orthopedics physiotherapy Dav institute of physiotherapy and rehabilitation, jalandhar.

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## THR preplanning during DDH: focus on acetabular spongius bone quality

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**Statement of the Problem:** Since implantation of the acetabular component into poor-quality bone is considered to be a risk factor for its instability and routine DXA is invalid for precise assessment of acetabular bone density, preoperative evaluation of bone density directly in the presumed implantation site via special methodic seems to be required. **Methodology & Theoretical Orientation:** There were revealed a complex comparative MSCT-morphometric assessment of acetabular spongius bone X-ray density (attenuationcoefficient) due to proposed technique of 32 normal hips and 65 hips with DDH Crowe III types. Patients with DXA-verified osteoporosis or osteopenia were excluded. The evaluation implied 5 mm-interval measuring due to topographical zones (supraacetabular area, anterior and posterior acetabular walls). Obtained results were stratified due to dysplastic sectoral deficiency subtype: antero-lateral, postero-lateral or total deficiency and analyzed with appropriate statistical methods. MannWhitney test, one-way analysis of variance and Spearman's rank correlation were used respectively. **Findings:** All dysplastic hips showed increasing of X-ray density of supraacetabular area with simultaneously with X-ray density loss of anterior and posterior acetabular walls in all sectoral deficiency subtypes. There were determined progressive increase of the X-ray density of the supraacetabular bone and steady decrease of anterior and walls ones in correlation with the femoral head cranial displacement. The most severe loss of acetabular spongius bone X-ray density in all the zones was observed during the total sectoral deficiency subtype. **Conclusion & Significance:** Detected changes of acetabular spongius bone X-ray density reflectsthe local degenerative processes and following changes of the biomechanical bonetissue properties occurred due to dysplastic deficiency formation that influence primary and delayed acetabular component's stability. The defined normal ranges and regularities of acetabular spongius bone X-ray density changes during DDH that should be taken into consideration for preoperative planning of acetabular component implantation.

### Recent publications:

- 1 Best bone of acetabulum for cup component placement in Crowe types I to III dysplastic hips: a computer analysis / D. Shonenberg, R. Guggenberg, D.Frey, H.-C. Pape [et al.] Osteoporos Int. - 2018. - Vol. 2. - P.459-465
2. Bone mineral density t-scores derived from CT attenuation numbers (Hounsfield units): clinical utility and application / Am. J. Radiology - 2014. - Vol.200. - P.961-967.
3. CBCT-based bone quality assessment: are Hounsfield units applicable? / R. Pauwels, R. Jacobs, S.R. Singer, M. Mupparapu // Dentomaxillofac Radiol. - 2015. - Vol.44, N 1. - P.2014-2028.

### Biography

Elena Kovbasa has obtained her PhD degree at the age of 29 years in Dnipro State Medical University, Ukraine. Her PhD thesis was dedicated to implantation characteristics of acetabulum implicated to THR during developmental dysplasia of the hip. After that she had been working as an Assistant Professor of Trauma and Orthopaedics Department of Dnipro State Medical University, Ukraine since 2019. Since 2023 she's Head of the Department of Clinical Sciences of Kharkiv Institute of Medicine and Biomedical Sciences. The main field of scientific search is preoperative planning for THR in various hip joint pathologies and postural balance restoring after THR during DDH. She has over 40 publications and international conferences reports, those have been cited over 30 times, and her publication h-index is 2.5.

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