



Mædica *a Journal of Clinical Medicine*

www.maedica.org

Editor-in-Chief: Mircea Cinteza

BOOK OF ABSTRACTS

1-2 November 2024

SOROT 20
Conference 24
K2 Alpin Conference Center / Poiana Braşov



SOROT
societatea romana de ortopedie si traumatologie

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www.sorotscientificevents.ro

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Mircea CİNTEZĂ, MD, PhD, Editor-in-chief

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SOROT 2024 CONFERENCE

Dear esteemed colleagues and members of the
National Orthopedics and Traumatology Community,

It is with great pleasure that I extend a formal welcome to you all for SOROT 2024 Conference. This highly anticipated event will take place in the picturesque town of Poiana Braşov, Romania, from November 1st to 2nd, 2024.

As President of SOROT, and on behalf of the SOROT Board, it is a distinct honor to host this prestigious scientific gathering, where we will come together to exchange knowledge, share ideas and discuss the latest advancements in the fields of orthopedics and traumatology. The theme of this year's conference, "*Transforming Difficult Cases into Success: Excellence in Orthopedic Emergencies*", will provide a valuable platform for exploring emerging technologies, innovative techniques and best practices, while addressing the challenges faced in our discipline.

We are proud to present a distinguished program featuring renowned national and international speakers, alongside leading experts and experienced practitioners, who will offer their insights and expertise across a range of topics. Participants will have the opportunity to engage in interactive sessions and dynamic debates, fostering a spirit of collaboration and professional development.

On behalf of the SOROT Executive Board, I would like to express our deep appreciation to our partners and to the Scientific Committee for their unwavering support in making this conference possible. We are confident that the SOROT 2024 Conference will be an exceptional event, showcasing the pinnacle of achievements in our field.

We look forward to welcoming you in person and sharing a memorable experience together in Poiana Braşov.

Yours sincerely,
Assoc. Prof. Razvan Ene, SOROT President

Comparative Analysis of PROMs over Time between Manual and Robotic Unicompartmental Knee Arthroplasty: a Systematic Review and Meta-Analysis

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ABSTRACT

Objectives: Unicompartmental knee arthroplasty (UKA) effectively treats localized knee osteoarthritis, with robotic-assisted techniques potentially improving outcomes over manual methods. This systematic review and meta-analysis evaluates existing evidence, with comparing patient-reported outcome measurements (PROMs) between robotic and manual UKA across different time points.

Materials and methods: Following PRISMA guidelines, a systematic review and meta-analysis was conducted using a literature search across MEDLINE (via PubMed), Cochrane Library, Web of Science, Scopus and Epistemonikos from inception to May 26, 2024. The inclusion criteria were comparative studies between robotic and manual unicompartmental knee arthroplasty. Exclusion criteria were cadaveric, in vitro, editorials, commentaries, non-English and non-human studies. Study characteristics were recorded including the level of evidence, subject demographics, surgical technique, follow-up and PROMs. Descriptive statistics, data uniformization, meta-analysis and subgroup analysis were employed for data analysis and synthesis.

Results: A total of 2,774 studies were identified, of which 20 studies reporting PROMs were included in the final analysis. The eligible studies had the following levels of evidence: level III (12 studies), level II

(seven studies) and level I (one study). Seventeen PROMs were identified, with two studies also reporting gait analysis. The PROMs were categorized into six time points: preoperative, immediate postoperative and beyond 6, 12, 24 and 60 months after surgery. There were significant differences in the following scores: KOOS at 12 months, KSS functional and WOMAC pain at 24 months and KSS functional at 60 months; however, the results were inconsistent. In robotic patients, the forgotten joint score (FJS) was significantly higher ($p < 0.05$, effect size 0.63) at < 6 months and it remained consistent over time but not statistically significant at other time intervals. Subgroup analysis for patients with UCLA scores > 5 showed that robotic UKA subjects with UCLA > 5 had significantly ($p < 0.05$) higher KSS scores at 24 and 60 months (effect size 0.915 and 1.851) than the overall robotic group. However, both manual and robotic groups with UCLA > 5 had lower ($p < 0.05$) pain ratings at 24 months (effect size 0.475 and 0.748) and higher FJS at 60 months ($p < 0.05$, effect size 0.943 and 1.147).

Conclusions: The available data suggests that robotic UKA could improve FJS compared to manual UKA, although data on the remaining PROMs is inconsistent. High preoperative activity levels could indicate better results after UKA, especially after robotic UKA.

Keywords: unicompartmental knee arthroplasty, meta-analysis, PROMs, robotic, conventional UKA.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.1. KNEE & LOWER LEG

Current Developments in Oxford Unicompartmental Knee Arthroplasty

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ABSTRACT

Objectives: The Oxford unicompartmental knee arthroplasty (O-UKA) has seen significant improvements in surgical techniques over the years. When we talk about O-UKA, the choice of the right indication has always had an essential place since this intervention was described. With this paper, we wanted to report our experience as initially interested surgeons, seduced by the results of UKAs, and now passionate in the use of these prostheses.

Materials and methods: If we follow the Romanian National Arthroplasty Registry statistics, this trend is confirmed, in recent years, at the national level with the overall progression of UKA's implanted, even if we are more than ten years behind European values. From 2003 to 2017, the share of UKA in knee prosthetic surgery decreased from 3% to less than 2%. During this same period, the installation of total knee prostheses stable increased by 26%. It is usually accepted that a knee surgeon has a rate of unicompartmental knees of around 15% across all prosthetic indications. To achieve a rate of 25% with our current practice, we have to improve both the indications and surgical technique.

Results: The development of minimally invasive surgical techniques has been a major improvement. These techniques involve smaller incisions, reduced blood loss and, most importantly, especially during pandemics, shorter hospital stays with shorter recovery times. The design of UKA has also evolved. We are using the Phase 3 Oxford Knee, which offers anatomically shaped tibial components for optimal coverage and redesigned meniscal bearings to minimize impingement. The introduction of Microplasty instrumentation allowed us to improve the precision of the procedure, with easing adequate bone resection and correct alignment of the implants. We look into current developments described in the literature like femur-first technique, kinematic alignment and preoperative planning with digital X-ray analysis.

Discussion: When we discuss knee joint reconstruction, the approach of providing the most conservative solution in terms of bone stock and ligament preservation is always admirable. Several reasons explain this technical imperative. The extreme age (younger than 60, older than 80) of our patients with advanced – Kellgren stage IV – degenerative disease of the knee requires us to think about recovery even before the first implantation. The functional results of UKA are in any case closer to a normal knee than those of total knee

arthroplasty. Long-term survival is discussed with patients, but the restored quality of life is one of the first things requested by them. Oxford unicompartmental knee arthroplasty has significantly evolved over time as a result of advancements in technology, surgical techniques and patient outcomes. Initially proposed as a treatment for unicompartmental antero-medial tibio-femoral disease, UKA encountered challenges such as patient selection criteria, technical complexity and implant positioning disagreements.

Conclusion: *Oxford unicompartmental knee arthroplasty has the ability to forget the knee by preserving the central pivot, the benefit of which has been demonstrated on numerous occasions on the proprioceptive level. This is the main reason which encourages us to implant a unicompartmental prosthesis if the specifications are met.*

Keywords: Oxford unicompartmental knee arthroplasty (O-UKA), minimally invasive surgery, UKA design, phase 3 Oxford knee, microplasty instrumentation, kinematic alignment, femur-first technique, preoperative planning, bone stock preservation.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.1. KNEE & LOWER LEG

Current Perspectives on Lateral Extraarticular Procedures in Primary and Revision ACL Reconstruction

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ABSTRACT

Objectives: The purpose of this presentation is to provide a comprehensive review of contemporary concepts regarding the indications and surgical techniques for lateral extraarticular procedures (LEAP) when combined with anterior cruciate ligament (ACL) reconstruction. This includes their application in both primary and revision settings, as supported by the current literature.

Material and methods: Data from a randomized controlled trial by the SANTI group comparing combined ACL reconstruction (ACLR) with LEAP to isolated ACLR were analyzed. These results were corroborated with additional clinical studies, including a prospective matched study from the same research group, focusing on the radiographic incidence of knee osteoarthritis (OA) following isolated ACLR versus ACLR combined with anterolateral ligament (ALL) reconstruction. Additionally, studies exploring different LEAP techniques, such as the comparison between bone-patellar tendon-bone (BPTB) grafts with the modified Lemaire technique and hamstring tendon (HT) grafts combined with ALL reconstruction, were included. Notably, findings from the "Anterior Cruciate Ligament Reconstruction Failure and Revision Surgery: Current Concepts" study by the LaPrade group were also considered.

Results: In a cohort of 1,145 patients, 553 subjects underwent isolated ACLR and 592 ACLR combined with ALL reconstruction. The graft rupture rate was significantly higher in the isolated ACLR group using BPTB grafts (11%) compared to the combined ACLR with HT and ALL group (4.2%). Additionally, the reoperation rate was substantially higher in the isolated group (25.9%) compared to the combined group (7.4%). A separate clinical comparative matched study included 36 matched pairs, with mean follow-up periods of 56 ± 35 months for the BPTB-Lemaire group and 57 ± 23 months for the HT-ALL group ($P = .91$). While there were no statistically significant differences in graft rupture rates (HT-ALL 0%; BPTB-Lemaire 11.1%; $P = .13$) or reoperation rates (HT-ALL 8.3%; BPTB-Lemaire 22.2%; $P = .23$), no specific complications related to lateral extraarticular techniques (LET) were reported in either group.

Conclusions: *The combination of ACLR with lateral extraarticular procedures, whether the modified Lemaire technique or ALL reconstruction, demonstrates significantly better outcomes compared to isolated ACLR. These combined procedures result in a lower graft rupture rate, fewer reoperations and a longer survival rate for the medial meniscus in both primary and revision cases. Therefore, incorporating LEAP techniques into ACLR appears to be an essential approach for improved long-term results.*

Keywords: knee, ACL, LEAP, ALL, Lemaire.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.1. KNEE & LOWER LEG

Lower Rate of Complications and Improved Postoperative Radiological Measurements, Robotic Vs Conventional Technique in Unicompartmental Knee Arthroplasty – a Meta-Analysis

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ABSTRACT

Objectives: The purpose of this meta-analysis is to compare the recent advancement of the robotic approach against the conventional technique in unicompartmental knee arthroplasties (UKAs). We discuss demographics, radiological measurements of interest, surgery duration, rate of revision, aseptic loosening, progression of disease and other complications.

Materials and methods: A systematic review was conducted according to PRISMA guidelines. The literature search was performed from inception to 26 May 2024 on MEDLINE (via PubMed), Cochrane Library, Web of Science, Scopus and Epistemonikos databases. Inclusion criteria were robotic and manual UKA. Exclusion criteria were cadaveric, in vitro, editorials, commentaries, non-English and non-human. Study characteristics, including subject demographics, surgery duration, radiological measurements and complications, were recorded. Outcomes were summarized using descriptive statistics in Microsoft Excel and IBM SPSS Statistics.

Results: A total of 2,774 studies were identified, including 35 studies from databases and one study from cross-referencing; 21 studies have reported complications, with 17 of them reporting revisions. The

results of this meta-analysis have shown a significantly lowered risk of revision [odds ratio (OR) 0.506, 95% CI (confidence interval) 0.399 to 0.643, $p < 0.001$] and aseptic loosening (OR 0.459, 95% CI 0.303 to 0.693, $p < 0.001$). A sensible lowering of progression of disease (OR 0.418, 95% CI 0.211 to 0.827, $p = 0.012$), malalignment (OR 0.09, 95% CI 0.012 to 0.670, $p = 0.018$) and periprosthetic fracture (OR 0.180, 95% CI 0.042 to 0.767, $p = 0.020$) was analyzed. Sixteen studies have reported the pre-op (pre-operative) and post-op (post-operative) measurements of interest, tibial slope, HKA (hip knee angle) and Weber joint line height. The results show a statistically significant pre-op HKA difference between CONV (conventional) ($176.16^\circ \pm 3.00^\circ$) and ROBO (robotic) ($174.81^\circ \pm 3.19^\circ$), with $p < 0.001$. Post-op achieved tibial slope CONV ($83.48^\circ \pm 3.07^\circ$) and ROBO ($84.70^\circ \pm 2.12^\circ$), with $p < 0.001$, and Weber joint line height CONV ($2.80^\circ \pm 1.84^\circ$) and ROBO ($1.21^\circ \pm 1.61^\circ$), with $p < 0.001$. There was no statistical difference in pre-op tibial slope between CONV ($80.75^\circ \pm 2.91^\circ$) and ROBO ($81.06^\circ \pm 2.81^\circ$) ($p > 0.005$). Post-op HKA CONV ($177.67^\circ \pm 3.67^\circ$) and ROBO ($177.65^\circ \pm 2.87^\circ$), with $p > 0.005$. There was a strong statistically significant increase in operation time between ROBO (81.07 ± 17.56 min) and CONV (76.53 ± 18.64 min), with $p < 0.001$.

Conclusions: There is a favorable outlook on the new technique, although its use poses challenges such as surgery duration, and also shows promise to lower revisions and improve post-op radiological measurements.

Keywords: robotic, conventional, meta-analysis, complications, radiological measurements, unicompartmental knee arthroplasty.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.1. KNEE & LOWER LEG

Effectiveness of Systemic Antibiotic Prophylaxis in Total Knee Arthroplasty in Romania: an Observational Analysis of Infection-Related Revision Risk (2010–2020)

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ABSTRACT

Objectives: This study aimed to compare the risk of revision for periprosthetic joint infection (PJI) based on the use of antibiotic-loaded bone cement and the number of postoperative systemic antibiotic prophylaxis (SAP) doses in patients undergoing total knee arthroplasty (TKA) in Romania.

Materials and methods: A total of 30,332 TKA cases reported in the Romanian National Arthroplasty Registry between 2010 and 2020 were analyzed. Of these, 57.7% used antibiotic-loaded bone cement with SAP and 42.3% used plain cement. One-year PJI revision rates were compared between groups and the impact of SAP dose count (1–4 doses) was assessed.

Results: The ONE-year revision rate for PJI was 0.4% in the antibiotic-loaded cement group and 0.8% in the plain cement group. In the subgroup receiving four SAP doses with plain cement, the revision risk was higher (2.06%) compared to single-dose prophylaxis (0.92%). Among those with antibiotic-loaded cement, single and multiple SAP dose regimens showed comparable effectiveness, with no statistically significant differences.

Conclusions: Romanian registry data suggest that a single dose of SAP in combination with antibiotic-loaded cement does not increase PJI risk and may offer a safe and efficient alternative to multiple-dose regimens. Reducing the number of SAP doses may help lower costs, enhance patient safety and reduce antimicrobial resistance.

Keywords: antibiotic prophylaxis, total knee arthroplasty, periprosthetic joint infection, revision, Romania, national registry.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.2. PELVIS, HIP & FEMUR

Key Points for Magnetic Resonance Imaging of Hip Impingement

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ABSTRACT

Objectives: The aim of this review is to highlight and illustrate the key magnetic resonance imaging (MRI) features in patients with hip pain caused by various types of hip impingement. Understanding the different imaging characteristics of intra- and extra-articular impingements is essential for accurate diagnosis and optimal treatment planning.

Material and method: We conducted a comprehensive review of the most recent literature on hip impingement and evaluated MRI scans of patients presenting with clinically suspected hip impingement over the last five years. Imaging findings were analyzed, focusing on the MRI patterns associated with both intra-articular femoroacetabular impingement (FAI) and extra-articular hip impingement (EAHI), including subtypes such as iliopsoas impingement, subspinal impingement and ischiofemoral impingement.

Results: Two primary categories of hip impingement are currently recognized: intra-articular impingement, characterized by pathological contact between the femoral head and acetabulum due to abnormal morphologies (as seen in cam and pincer deformities), and extra-articular impingement, which involves pathological contact between the proximal femur and pelvic structures or adjacent soft tissues. Femoroacetabular impingement, with its cam or pincer morphologies, is a major cause of labral and chondral damage and may accelerate the progression to osteoarthritis. Magnetic resonance imaging plays a crucial role in detecting these early changes. In contrast, EAHI, which includes conditions such as iliopsoas, subspinal, trochantero-pelvic and ischiofemoral impingement, often presents with hip pain but does not typically lead to arthritic changes. These forms of impingement are less understood and frequently overlooked, though MRI can differentiate them with high accuracy.

Conclusion: Femoroacetabular impingement and EAHI can coexist and both may present with similar clinical symptoms. Magnetic resonance imaging is essential in distinguishing between these two categories

and their subtypes, with ensuring an accurate diagnosis and guiding appropriate therapeutic interventions. Recognizing the MRI characteristics of these conditions is crucial for managing patients and preventing long-term complications, including early osteoarthritis and persistent pain. This review underscores the importance of MRI in the early detection and characterization of hip impingement.

Keywords: hip impingement, femoroacetabular impingement, extra-articular hip impingement, MRI, cam deformity, pincer deformity, ischiofemoral impingement.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.2. PELVIS, HIP & FEMUR

Retrospective Study of One-Month and Three-Month Survival Rate of Elderly Patients with Hip Fractures Correlated with Time to Surgery

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ABSTRACT

Objectives: The objective of the present study was to correlate the one-month and three-month survival rate of elderly patients with hip fractures and the time elapsed between fracture and surgery.

Materials and methods: We conducted a retrospective study of 114 elderly patients aged >75 years old (66 subjects with trochanteric fractures and the remaining 48 ones with fractures of the neck of the femur) whose time to surgery was noted. Participants or their families were contacted at one month and three months mark and their current state was noted. The survival rate was also noted and correlated with the time to surgery.

Results: Patients confirmed to have died had a higher chance of being from the cohort of subjects who were operated on within more than 36 hours.

Conclusions: Our findings confirm what Orthopedics and Traumatology clinicians have always known, that is the sooner you operate on an elderly patient with a hip fracture, the better results are achieved. Further studies on larger numbers are necessary to better evaluate different parameters such as specific comorbidities, surgeon preference on implant, etc and their eventual correlation with survival rate at one month and three months, respectively.

Keywords: hip fracture, neck of the femur fracture, throchanteric fracture, survival rate, time to surgery

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.3. SPINE

Balancing Innovation and Tradition: Initial Insights from Navigation-Assisted Spinal Surgery

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ABSTRACT

Objectives: This study aims to explore how to better integrate navigation-assisted technology in spinal surgery and the operating room, focusing on initial insights and results from the first cases performed with the use of navigation-assisted technology. The objective is to assess the impact of this technology on surgical precision, time, outcome, patient satisfaction and postoperative rehabilitation, while maintaining established safety standards.

Materials and methods: This study analyzes consecutive patients who underwent spinal surgery during one month period of using a demo navigation-assisted technology (Stealth-Station S8 Surgical Navigation System, Medtronic®). We performed a comparison between traditional and navigation-assisted procedures in the cohort of patients undergoing spinal surgery. Patients who underwent navigation-assisted spinal-surgery included one disc herniation with segmental instability, two idiopathic thoraco-lumbar scoliosis and one thoracic kyphosis in the experimental group and were matched with similar pathologies in the control group. We collected data on overall operative time, preoperative preparation, radiographic accuracy of implant placement, postoperative pain, rehabilitation and recovery, length of hospital stay and follow-up satisfaction at six weeks as well as three and six months after surgery. The experimental group benefited from navigation-assisted surgeries that employed preoperative O-arm image acquisition with advanced imaging tools and real-time guidance systems, while the control group followed standard manual techniques using classic fluoroscopy.

Results: Results indicated an improved precision in implant positioning and reduced intraoperative complications in the navigation-assisted group compared to the control group. Because of the learning curve of the new technology, overall operative times were longer in the navigation-assisted group, along with longer preoperative operating room preparation and some technical issues regarding the positioning of the operating table and the O-arm. Patient recovery metrics, including pain scores and mobility, showed

no significant differences between the two groups. The length of stay in the hospital was one day shorter in the experimental group. While no significant differences in postoperative follow-up between the two groups were recorded, the navigation-assisted spine surgery proved to be less stressful for the surgeon once the use of the system was discovered and learned.

Conclusions: *Navigation-assisted spinal surgery demonstrates potential benefits in terms of screw-placement precision and reducing the rates of complications. However, balancing innovation with tradition is critical, as using new technology must not compromise the overall safety of the patient and the surgery. Further research with a larger patient cohort is needed to solidify these findings.*

Keywords: spine surgery, navigation-assisted spine surgery, technology, innovation.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.3. SPINE

Our Experience in Spine Revision Surgery

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ABSTRACT

Objectives: The number of spinal interventions has significantly increased in the recent years through the evolution of surgical techniques and the improvement of technological equipment at the national level. Thus, the number of cases with complications from spinal surgery and their degree of difficulty is also increasing. The purpose of the present study is to describe the experience of our medical center regarding means of surgical treatment of revisions in spinal surgery through a statistic that includes revisions made in chronic spinal cases and revisions in septic spinal cases performed in the last five years.

Material and methods: This study presents data on chronic spinal cases and spinal septic cases who had a history of at least one spinal surgery and required surgical revision in our medical center, which were collected during the last five years. The cases were thoroughly investigated both clinically [assessment of patient status, determination of the degree of motor and sensory deficit] and paraclinically [radiographs, computed tomography (CT) and magnetic resonance imaging (MRI) scans, histopathological tests] before planning and performing the revision surgery. In some cases, a multidisciplinary approach was required to perform the revision surgery. In all cases that benefited from revisions, it was necessary to lengthen the spinal instrumentation, and in some cases anterior stabilization with or without corpectomy surgery was necessary. After discharge, patients were called to regular check-ups, when they were periodically evaluated both clinically and paraclinically.

Results: Patients included in our study underwent thorough clinical and paraclinical examinations before and after the revision surgical intervention. Due to the experience of the surgical teams and the technological equipment available in our center, patients who required complex spinal revision surgery had a favorable clinical and paraclinical evolution with subsequent complete recovery.

Conclusions: Our experience regarding revisions in spinal surgery suggests that, in order to increase the chances of a favorable evolution and offer the best surgical treatment solutions to these difficult cases, thorough investigation, multidisciplinary collaboration, appropriate technological equipment and experienced surgical teams are crucial elements.

Keywords: spine, revision, complications, septic, multidisciplinary.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.4. VARIA

MgB₂-Based Materials as Candidates for the Fabrication of Biodegradable Orthopaedic Implants

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ABSTRACT

Objectives: Our study explores the potential of magnesium diboride (MgB₂)-based materials as candidates for biodegradable orthopaedic implants. We examine the properties of the material, its applications in orthopaedics and comparisons with traditional biomaterials. The paper also addresses the challenges and limitations associated with MgB₂ in the fabrication of implants, focusing on its future role in bone repair and regeneration.

Materials and methods: We performed a comprehensive literature search using databases such as PubMed, Google Scholar and ScienceDirect, focusing on studies related to the biomedical applications of MgB₂ and its biodegradable properties. We analyzed key factors such as biocompatibility, corrosion rate, mechanical properties and clinical outcomes in orthopaedic use. Additionally, case studies on existing orthopaedic implant materials were reviewed for comparison. In our paper we explored and detailed the degradation profile of MgB₂, its ability to support bone healing and how it can reduce the need for secondary removal surgeries.

Results: Magnesium diboride exhibits favorable mechanical properties, which are suitable for temporary orthopaedic implants, with a corrosion rate that allows controlled degradation over time. Studies show that its biocompatibility and osteoconductivity make it an attractive alternative to traditional metals like titanium or stainless steel. The degradation products of MgB₂ show minimal toxicity in animal models as well as potential benefits in reducing inflammation and promoting bone growth. However, we have identified challenges such as optimizing the corrosion rate and improving mechanical strength for load-bearing applications remain. These limitations highlight the need for further research to enhance its clinical viability.

Conclusions: MgB₂-based materials offer promising potential as biodegradable orthopaedic implants, combining favorable mechanical properties with biodegradability. The future of these materials in orthopaedics lies in their ability to provide temporary support while reducing the risks associated with permanent implants. Nevertheless, additional research is required to address limitations in mechanical performance and corrosion control to fully realize the clinical applicability of MgB₂. These advancements in MgB₂ research could become a cornerstone in the next generation of orthopaedic implants.

Keywords: magnesium diboride, innovative materials, biodegradable, orthopaedics, implant.

Retrospective Evaluation of Risk Factors Leading to Prosthetic Joint Infections

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ABSTRACT

Introduction: Prosthetic joint infections (PJI) remain a significant post-surgical complication in orthopedic surgery, despite advancements in surgical techniques and infection control measures. These infections have a global incidence of 0.5-2%, leading to extended hospital stays, increased medical costs and, in severe cases, mortality. The present study focuses on the retrospective evaluation of PJI in patients treated in our clinic, which is a high volume university hospital.

Objectives: The present study aims to determine the incidence and etiology of periprosthetic infections within the clinic and identify contributing factors such as patient comorbidities, surgical techniques and operating room conditions.

Materials and methods: This retrospective study analyzed data from patients who underwent arthroplasty between January 2023 and July 2024 in our clinic. Factors such as the type of prosthesis, patient demographics, comorbidities, surgical team experience and operating conditions were evaluated. Data was collected from patient records. We used statistical analysis to identify significant correlations.

Results: The overall incidence of PJI was 1.59% of all surgical interventions, 0.76% in elective surgeries and 4.05% in emergency cases. Of the total PJIs, 8.33% were performed by surgeons with lower patient volume and experience and 0.6% by surgeons with higher patient volume and experience. Additionally, the operating room environment plays a crucial role, with 0.89% of the total PJIs occurring in a room with laminar airflow and controlled temperature, while 2.84% occurred in an operating room without controlled temperature and laminar airflow, highlighting the importance of these factors. Higher infection rates were observed in diabetic patients and those with extended surgical times. *Staphylococcus aureus* was identified as the predominant pathogen. Furthermore, a direct association between longer surgical duration and increased infection risk was found, with a 9% increase in risk for every additional 15 minutes of surgery.

Discussion: The findings of the present study align with the existing literature, confirming the importance of stringent preventive measures in orthopedic surgery. Identified risk factors, such as obesity, diabetes and

extended surgery time, highlight the need for rigorous infection control protocols. The role of bacterial biofilms in complicating treatment underscores the necessity of developing new therapeutic approaches. Our study aligns with existing international data but also underscores specific local challenges, such as differences between operating rooms and their impact on infection rates.

Conclusions: *Prosthetic joint infections continue to pose a substantial risk in orthopedic surgery, particularly in emergency procedures. Reducing surgical time, optimizing operating room conditions and paying special attention to high-risk patients, especially those with comorbidities like diabetes, are crucial steps in lowering infection rates. Further extended studies are recommended to refine prevention strategies and improve patient outcomes.*

Keywords: prosthetic joint infections, risk factors, comorbidities, surgical techniques, operating room conditions.

SECTION I – ORAL PRESENTATIONS

I.1. ORTHOPAEDICS

I.1.4. VARIA

The Correlation between the Place of Residence and Bone Mineral Content and Density – Preliminary Results

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ABSTRACT

Objective and aims: This research aims to determine the influence of daily activity on bone density, focusing on the place of residence.

Hypothesis: We supposed that bone mineral content and density are correlated with the daily physical activity regarding the place of residence (urban/rural). For people living in urban areas, a comparison has been made between those who live in a house and those who live in an apartment building (also if they used the elevator or the stairs).

Significance: It is well known that daily physical activity improves the general health status, but what if it has a beneficial effect on bone mineral content and density too? Through this prospective study, we emphasize that a healthy lifestyle has wider benefits than those discussed in the literature.

Methods: We conducted a prospective study of patients selected from MedLife Hospital Brasov, Romania. We have included women in menopause who came for a diagnostic test using dual-energy X-ray absorptiometry (DEXA). Through a special form, patients introduced the demographic data and reported their daily physical activity. Therefore, they were selected for the study over 12 months beginning with 1 December 2023 and were further grouped based on their place of residence (urban or rural).

Results: Our paper presents the results provided by the study carried out between December 2023 and May 2024. We have identified 351 patients who underwent DEXA as a diagnostic test. In the urban area, the percentage of patients diagnosed with osteoporosis (48%) was higher than in the rural area (24%). When comparing the results between urban living patients (house) and rural living ones, we found that the number of subjects with osteoporosis was greater in the first group (41%) than the second group (24%). Most of osteoporosis patients from urban areas were living in apartment buildings. When comparing the cohorts of patients who were living in an apartment building without elevator at the ground or first floor to those who

were living on the third or fourth floor, we noted a small difference in the incidence of osteoporosis, which was diagnosed in 46% of subjects in the first group versus 44% of those in the second group.

Conclusion: *The risk of osteoporosis is lower in the cohort of patients from rural areas, who are more active than those living in urban areas. Among patients from urban areas, the incidence of osteoporosis was lower in those who had to use the stairs daily than the ones who lived on the ground or first floor.*

Keywords: osteoporosis, daily activity, osteoporosis risk factors, osteoporosis protective factors.

SECTION I – ORAL PRESENTATIONS

I.2. TRAUMATOLOGY

I.2.1. FOOT & ANKLE TRAUMA

Risk Factors for Asynchronous Rupture of Contralateral Achilles Tendons

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ABSTRACT

Objective and aims: This study aims to understand which are the factors that cause the development of contralateral tendinopathy leading to an asynchronous rupture and whether those factors can be influenced by therapy to reduce the risk.

Hypothesis: We suppose that the risk factors of the contralateral rupture of Achilles tendon (AT) could be modifiable and unmodifiable, providing the opportunity to identify preventive therapeutic options.

Introduction: Asynchronous AT rupture is associated with an impairment of the walking function and has a high clinical importance. Although the occurrence of cases is rare (8.3–24 ruptures per 100.000 people), the significant effects on patients' quality of life or careers (if the patient is an athlete) make it an important topic. There is no clear expert consensus regarding what can cause the degeneration of the contralateral AT, which are the patient's characteristics and the methods to prevent the development of tendinopathy.

Methods: We searched two databases (PubMed and Science Direct) by applying the following keyword terms: "Achilles Tendon", "contralateral" and "rupture". Eligible articles had to be published between the year 2004 and August 2024. We screened the two databases independently by reading the titles and abstracts of the papers and eventually selecting the ones appropriate for review.

Results: After searching the literature using the above-mentioned keywords we have obtained 3376 articles, out of which six articles with a total number of 447 participants met all criteria. Patients who used steroids or fluoroquinolones have been excluded because of the well-known risk of tendinopathy. All studies concluded that the rupture on one side increased the risk of contralateral tendinopathy based on the supposition that the usage of the contralateral TA was increased to protect the injured one. Thus, one study described the alteration of the ultrasonographic aspect of the contralateral AT in asymptomatic patients. Another study also found that the contralateral AT developed tendinopathy and the risk of rupture increased with symptomatology amplification in the first altered AT. Two studies concluded that blood type (type O / type B Rh+) was a statistically significant risk factor. Three studies showed that physical activity was a statistically significant risk factor. Two studies observed that gender, age and body mass index (BMI) were not significant risk factors.

Conclusion: *Patients' physical activity was the only modifiable risk factor identified by us. The blood type suggests that it may also be a genetic component of the disease. All studies conclude that the best preventive approach is the treatment of the affected side as soon as the lesion is identified to reduce the disuse of the contralateral TA.*

Keywords: Achilles tendon, contralateral tendon rupture, contralateral tendinopathy, contralateral Achilles.

SECTION I – ORAL PRESENTATIONS

I.2. TRAUMATOLOGY

I.2.2. HIP & FEMUR TRAUMA

Personalized Surgical Strategies for Managing Vancouver B Periprosthetic Femoral Fractures: a Retrospective Study

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ABSTRACT

Objectives: The increasing occurrence of periprosthetic femoral fractures (PFFs) near hip prostheses, specifically Vancouver B fractures, poses a significant therapeutic challenge. The objective of this study is to investigate personalized approaches for managing these fractures, assess the effectiveness of different treatment strategies and identify the risk factors that influence fracture characteristics and patient outcomes.

Materials and methods: We conducted a retrospective analysis of nine cases involving Vancouver B2 and B3 fractures treated at the University Emergency Hospital Bucharest between August 2022 and August 2023. Surgical interventions included open reduction and internal fixation (ORIF) with cortical strut allografts. The clinical outcomes were evaluated using the Harris hip score (HHS), while radiographic assessments were performed to monitor fracture healing and implant stability.

Results: Statistical analysis revealed the critical role of personalized treatment strategies in managing periprosthetic femoral fractures. Vancouver B1 fractures were effectively stabilized with ORIF and custom plate fixation. Vancouver B2 fractures required tailored fracture repair alongside prosthesis revision. In contrast, Vancouver B3 fractures, characterized by unstable stems and poor bone quality, necessitated extended prosthesis revision or the use of allograft-prosthetic composites.

Conclusions: The management of Vancouver B periprosthetic femoral fractures demands a personalized approach that considers the fracture type, implant stability and patient-specific factors such as comorbidities and bone quality. Single-stage ORIF is suitable for fractures with stable implants and adequate bone quality, while complex fractures with unstable stems require combined fracture fixation and prosthesis revision for optimal outcomes. Future research should focus on developing more comprehensive classification systems and exploring the potential of new technologies to enhance treatment results.

Keywords: periprosthetic femoral fractures, Vancouver B fractures, open reduction and internal fixation (ORIF), cortical strut allografts, personalized treatment strategies, prosthesis revision, fracture healing, Harris hip score (HHS).

SECTION I – ORAL PRESENTATIONS**I.2. TRAUMATOLOGY****I.2.3. KNEE & LOWER LEG TRAUMA**

New Axial Measurements in Patients with Knee Extensor Mechanism Malalignment and Trochlear Dysplasia

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ABSTRACT

Objectives: This study aims to introduce and evaluate new axial measurements, particularly the tibial tubercle-posterior intercondylar arch (TT-IC) distance, in patients with knee extensor mechanism malalignment and trochlear dysplasia. The goal is to determine whether TT-IC offers a more reliable alternative to the traditional tibial tubercle-trochlear groove (TT-TG) distance, especially in cases with high-grade trochlear dysplasia, where TT-TG measurements may be less consistent.

Materials and methods: In this study, data from 60 patients with extensor mechanism malalignment who underwent osteotomy between 2016 and 2022 were analyzed. The study was conducted in the Orthopedics and Traumatology Clinic of Bucharest University Emergency Hospital, with ethical approval and patient consent. Computed tomography (CT) and magnetic resonance imaging (MRI) were used to evaluate diagnostic parameters, including TT-TG distance, trochlear angle, lateral trochlear slope, trochlear asymmetry and the new TT-IC measurement. Statistical analysis was performed using IBM SPSS Statistics version 21, employing Mann-Whitney U, Wilcoxon and Chi-Square tests, with significance set at $p < 0.05$.

Results: The TT-IC measurement demonstrated greater accuracy and reliability, especially in patients with trochlear dysplasia, compared to the traditional TT-TG distance. Patients whose surgical interventions were guided by the TT-IC measurement showed significant improvements in postoperative functional scores. This suggests that the TT-IC distance may offer better guidance for surgical planning in complex cases.

Discussion: The findings of this study emphasize the limitations of the TT-TG distance as a reliable measurement in patients with trochlear dysplasia, particularly in those with high-grade dysplasia where the TT-TG values are often inconsistent between CT and MRI. This inconsistency can lead to challenges in accurately assessing tibial tubercle lateralization, which is critical for planning effective surgical interventions. In contrast, the newly proposed TT-IC distance demonstrated greater accuracy and reliability, providing a more consistent measurement that may better reflect the anatomical realities in these complex cases.

Conclusion: The TT-IC distance is a promising diagnostic tool for extensor apparatus misalignment and provides a reliable guide for surgical correction via tibial tubercle osteotomy. Further studies with larger cohorts are recommended to validate these findings.

Keywords: knee extensor mechanism malalignment, tibial tubercle-posterior intercondylar arch distance (TT-IC), trochlear dysplasia, surgical planning, diagnostic accuracy.

Study on the Influence of the Indexes Obtained from the Axial Measurements Made on Computed Tomography, Nuclear Magnetic Resonance and Radiology in Patients with Knee Extensor Mechanism Malalignment

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ABSTRACT

Objectives: This study aims to assess the impact of various imaging-derived indexes on the diagnosis and surgical management of knee extensor mechanism malalignment. Specifically, it evaluates the efficacy of measurements from computed tomography (CT), magnetic resonance imaging (MRI) and conventional radiography, focusing on parameters such as the tibial tubercle-trochlear groove distance (TT-TG), trochlear angle, congruence angle, patellar tilt, Insall-Salvati index, Caton-Deschamps index, Blackburne-Peel index, lateral trochlear inclination angle, trochlear height and trochlear facet asymmetry. The present study also seeks to clarify controversies in current practices by comparing the accuracy of these imaging modalities and identifying statistically significant correlations between various measurements and clinical outcomes, including prognosis and functional results.

Materials and methods: A prospective cohort study was conducted on 60 patients aged between 18 and 41 years. The study focused on measuring key parameters, including the tibial tubercle-trochlear groove (TT-TG) distance, trochlear angle, patellar tilt and others, using CT, MRI and radiographs. Preoperative and postoperative functional outcomes were assessed using the Kujala, Lysholm and Tegner scores.

Results: The results indicated significant differences in measurements based on the imaging modality. Computed tomography was found to be more reliable for certain measurements such as TT-TG distance, which directly influences the surgical decision-making. Postoperative functional scores significantly

improved across all metrics, with better outcomes observed in patients under 30 years of age and those with a body mass index (BMI) below 30.

Discussion: *The present study examined correlations between axial measurements from CT, MRI and radiography with anatomical anomalies, surgical procedures and functional outcomes in patients with patellar instability. Among the patients, 85% had more than three dislocations, and postoperative scores improved, especially in those aged under 30 years with a BMI below 30, while higher BMI was linked to lower scores. Computed tomography provided more reliable TT-TG measurements compared to MRI. However, the current study faced limitations, including a small sample size, variability in surgical procedures and inconsistencies among radiologists, potentially affecting result accuracy.*

Conclusion: *This research underscores the critical role of advanced imaging techniques in the diagnosis and management of knee extensor mechanism malalignment. Despite some limitations, including the small sample size and variations in surgical procedures, the present study provides valuable insights that can improve clinical outcomes through better diagnostic accuracy and personalized treatment strategies.*

Keywords: knee extensor mechanism malalignment, imaging modalities, tibial tubercle-trochlear groove distance (TT-TG), surgical management, functional outcomes.

A Look into the Past, Present and Future of 3D Printed Orthopaedic Implants

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ABSTRACT

Objectives: This paper aims to present a comprehensive review of the evolution of 3D printing, tracing its origins to present-day applications, with a particular focus on its integration into orthopaedic surgery. We will explore its role in research, preoperative planning and patient-specific solutions, including its applications in our own institution. Furthermore, we will discuss future directions for 3D printing in orthopaedics such as personalized implants, custom resection guides and the increasing role of surgical rehearsal using 3D-printed models.

Materials and methods: To examine the historical development of 3D printing, we conducted a search through the Google Patents archive in order to identify early 3D printing concepts. A literature review using PubMed, Google Scholar and Scopus was performed to identify the technological advancements and current applications of 3D printing in medicine. Our institutional experience with 3D printing utilized a stereolithography (SLA) printer with biocompatible resins, which was supported by advanced pre-print management software. We employed segmentation programs, mesh manipulation tools and 3D model conversion software to design and modify patient-specific models. Additionally, antibiotic-loaded cement and Kirschner wires were used in conjunction with 3D-printed molds to create custom antibiotic spacers.

Results: The current role of 3D printing in orthopaedics has significantly evolved, with advancements in technology enabling the production of highly accurate patient-specific implants and surgical tools. Our experience highlights the potential of 3D printing to streamline the production of custom implants, reduce intraoperative time and improve surgical outcomes. In particular, the spatial resolution required in orthopaedics is more achievable than in other fields due to the relatively lower demand for fine detail, making orthopaedic applications more feasible with current 3D printing technology. Moreover, antibiotic-loaded cement molds have shown promise in personalized treatment for infection management.

Conclusions: 3D printing represents a groundbreaking innovation in orthopaedic surgery, with the potential to revolutionize implant production and patient care. Though still in its early stages, its ability to create patient-specific solutions and enhance surgical precision is undeniable. As technology continues to advance, we anticipate a rapid expansion in the use of 3D-printed implants, custom surgical guides and preoperative rehearsal models, which will play a critical role in the future of orthopaedic surgery.

Keywords: 3D printing, orthopaedics, implant, plating, biocompatible, biodegradable, personalized medicine.

SECTION I – ORAL PRESENTATIONS**I.3. RESIDENTS**

A Rare Case of Bilateral Femoral Neck Fracture in a 20-Year-Old Patient with Osteogenesis Imperfecta

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ABSTRACT

Objectives: Osteogenesis imperfecta is characterized by collagen I genes mutations, resulting in low bone mineral density. Moreover, clinical presentation is variable and may present systemic manifestations. While mostly documented in pediatric patients, osteogenesis imperfecta is a permanent condition affecting patients throughout adulthood. Because shaft fractures are the most common injuries, femoral neck fractures have rarely been reported. Consequently, there is still debate regarding treatment strategies.

Materials and methods: We describe the case of a 20-year-old female patient with previous incomplete nontraumatic bilateral femoral neck fracture diagnosed in another clinic. Functional treatment of the fractures was recommended, with partial weight-bearing and recovery swimming. Two weeks later, after a slip and fall at the pool, she was brought to our department with complaints of severe left hip pain and inability to walk. Initial X-rays showed a Garden IV left femoral neck fracture. A full pelvis computed tomography (CT) confirmed the nondisplaced right side femoral neck fracture. The patient underwent open fracture reduction and osteosynthesis with three cannulated compression screws on the left side. Functional treatment has been chosen for the right-side incomplete fracture, including a four-week non-weight bearing plan, followed by partial weight-bearing on the right foot and partial weight-bearing on the left foot at eight weeks after the surgery. Bisphosphonate treatment was initiated after the surgery and genetic testing confirmed the Sp1 mutation of COL1A1.

Results: The surgical and clinical outcomes were initially positive, with the patient feeling no pain and having a favourable X-ray control. At the six-week follow-up, she complained about left hip pain and difficulty walking. After further follow-ups, non-union at the fracture site was observed, with avascular necrosis of the femoral head being diagnosed. Total hip arthroplasty was recommended.

Conclusions: Osteogenesis imperfecta is a challenging diagnosis in the Emergency Room as fractures are easily missed on X-rays. However, magnetic resonance imaging (MRI) and CT scans are helpful tools for diagnosis. While internal fixation is the preferred treatment for displaced fractures and functional treatment is chosen for nondisplaced fractures, complications such as nonunion are often reported. Whether total hip arthroplasty would have been the better treatment option is still debatable.

Keywords: femoral neck fracture, osteogenesis imperfecta management.

Case Report: Impact of Mental Disorders in the Outcome of Total Knee Arthroplasty

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ABSTRACT

Objectives: Patients with advanced knee osteoarthritis (KOA) present with severe pain and movement limitations, which affect the quality of their everyday life and lead to impaired social functioning. Many of these individuals have pre-existing mental disorders that can adversely affect their outcomes after surgery for KOA by having greater postoperative pain, poorer functional improvement, higher complication rates and longer hospital stays. In patients with poor mental status, complications often occur because of postoperative delirium and poor adherence to medical advice.

Materials and methods: We present the case of a 65-year-old female patient suffering from KOA for the last years, with severe pain and instability in both knees, who underwent total joint arthroplasty of the right knee. She was also diagnosed with anxiety disorder and depression under medical treatment.

Results: The next postoperative day, the patient fell from her bed during a delirium episode and suffered a right Evans V trochanteric hip fracture. We promptly treated the fracture with a proximal femoral Gamma nail. Afterwards, the patient recovered under strict observation and was discharged to home. A week later, she was readmitted after another fall at home, which this time resulted in a hip implant cut-out. After analysing the quality of the remaining bone through a CT evaluation, we decided to reoperate and reposition the trochanteric nail. We forbidden the patient from weight bearing walking for a month and kept her admitted longer for better and supervised recovery.

Conclusions: Mental disorders, which are often neglected or underdiagnosed when treating KOA patients, could lead to postoperative complications unrelated to the surgical technique or implant of choice. A careful patient medical history should be taken before deciding the optimal treatment plan to decrease the rate of complications, the length of hospital stay and the readmission rate. These patients should be referred to a psychiatrist first to relief the symptoms and increase their compliancy, functional outcome and overall satisfaction rate.

Keywords: knee osteoarthritis, total knee replacement, mental disorders, hip fracture.

SECTION I – ORAL PRESENTATIONS**I.3. RESIDENTS**

Distal Femoral Lateral Plating in a Patient with a 6 cm Bone Defect: a Case Report

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ABSTRACT

Objectives: Femur fractures are one of the most common reasons for emergency room presentation. Moreover, due to the extension of life expectancy, the frequency of new fractures on bones with existing osteosynthesis material is increasing.

Materials and methods: We present the case of a 66-year-old male patient with a distal right femoral shaft fracture with an existing short gamma nail on the same leg. The patient was brought to the emergency room. After stabilization, he was transferred to the orthopedic ward for further management. Initial X-rays showed comminution in the distal femoral shaft. The operation plan comprised open reduction of the distal femoral shaft and internal fixation with a titanium distal femoral plate with locked and cortical screws, with the conservation of the previous gamma short nail. During the open reduction of the fracture, a bone defect of 6 cm was observed on the lateral face of the femur. Because of the comminution additional 4-wire cerclages were used. On the orthopedic ward, isometric muscle contractions were recommended for the first three days after surgery and bed plan movement of the leg along with passive knee mobilization. Additionally, non-weight-bearing walking on the operated leg and bed rest for the first six weeks after surgery were recommended. Also, the patient was recommended a three-month Calcium and vitamin D treatment. Wound healing progressed favorably and at the six weeks control, the patient's status was improved, with X-rays showing callous formation at the fracture site. To evaluate the healing process, a native computed tomography (CT) scan was requested, which showed callous formation and closure of the bony gap. The patient was recommended another three weeks of non-bearing movement, followed by partial weight-bearing using a walker, with another control scheduled after six weeks.

Results: At the six-week control, the patient presented good knee mobilization of the operated limb with visible callous at the fracture site. He felt only minor discomfort from the leg and presented good non-weighted mobilization. The CT evaluation revealed good bone formation in fracture area. The clinical outcome was favourable.

Conclusions: The correct planning and usage of osteosynthesis material as well as an early mobilization plan are paramount for the good recovery of orthopedic-trauma patients, especially with an ageing population with an increasing number of chronic afflictions.

Keywords: femoral shaft fracture, existing gamma nail, bone defect osteosynthesis.

Distal Femoral Shaft Non-Union and Dual-Plate Mechanical Complication in an 84-Year-Old Patient: a Case Report

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ABSTRACT

Objectives: The optimal treatment for femoral shaft fractures remains a disputed topic, as there are numerous options for treatment. Femoral plating remains a well-known surgical treatment for distal femoral fractures. Dual plating has biomechanical advantages, including the prevention of varus collapse, but it can affect material fixation in osteoporotic bones, especially when excess material is used, force distribution is unequal and material elasticity is compromised.

Materials and methods: We present the case of an 84-year-old female patient who was brought to the emergency room complaining about inability to walk, pain in the right leg and lateral leg swelling. After clinical and X-ray examination, she was diagnosed with lateral and anterior femoral plate mechanical complication, screw breakage and fracture non-union after two years. The patient was admitted to the orthopedic ward for surgical treatment. Because she had an existing hip arthroplasty on the fractured leg, the operation plan comprised the extraction of the dual plates along with the nails, open reduction of the fracture and osteosynthesis with a lateral bridging femoral plate with locked screws. During surgery, severe comminution of the medial facet of the femur was observed and one broken screw could not be extracted. Artificial Calcium-phosphate bone graft was used to fill the non-union and fracture-fragment reaming to stimulate callous formation. On the orthopedic ward, isometric contractions of the knee and thigh were recommended for the first three days after surgery. The patient was discharged with recommendations of passive mobilization of the femur for the first two weeks, followed by active mobilization and non-weight bearing walking on the operated leg for eight weeks. Clinical control with X-rays was scheduled at eight weeks after surgery.

Results: Postoperatively, the patient had a favourable course with a decline in pain and leg swelling; also, control X-rays displayed favourable reduction and good conservation of hip arthroplasty. At the time of hospital discharge, the patient was able to perform assisted knee flexion with minimal pain complaints.

Conclusions: The correct usage and positioning of femoral plates is paramount for optimal bone healing, especially in patients with known osteoporosis. Also, the need to preserve the existing prosthetic material should be of main importance.

Keywords: femoral fractures, non-union, osteoporosis.

SECTION I – ORAL PRESENTATIONS**I.3. RESIDENTS**

Non-Anatomic Reconstruction in Multiligament Knee Injuries: a Functional Approach

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ABSTRACT

Objectives: This study aims to assess the effectiveness of multiligament knee reconstruction in restoring stability and function in patients with severe instability from trauma to at least two ligaments. It focuses on postoperative improvements in middle-aged patients with moderate physical activity and highlights key indications for surgery, including severe injury, persistent instability, failed conservative treatment, acute functional impairment and chronic instability.

Materials and methods: For the present study, three scoring systems were utilized: the International Knee Documentation Committee (IKDC) score, the knee injury and osteoarthritis outcome score (KOOS) and the Tegner Lysholm score. These scores were provided by patients preoperatively as well as at three and minimum 12 months postoperatively. The multiligament reconstruction performed in our clinic was based on three types of grafts: fresh frozen allograft, autograft, or a combination of both. In cases where allografts were used, the Achilles tendon was preferred, with “single Achilles tendon allograft and single femoral tunnel” being the most frequently performed technique. For follow-up, patients attended periodic evaluations during which specific clinical examinations were conducted. Between 2019 and 2023, all patients with chronic multiligament knee injuries (MKI) treated in our clinic were included in this prospective observational study. Chronic MKI was defined as injuries persisting for eight weeks or longer. Diagnoses were made based on medical history, clinical examination and magnetic resonance imaging (MRI). Our study included patients with injuries to two or more major ligaments: anterior cruciate ligament (ACL), posterior cruciate ligament (PCL), medial collateral ligament (MCL) and lateral collateral ligament (LCL). Between 2019 and July 2023, 60 patients with MKI underwent one-stage reconstruction using a combination of allograft and autograft techniques. In a retrospective cohort of 60 MKI patients who had undergone arthroscopic reconstruction, we assessed knee range of motion, return to work as well as IKDC, KOOS and Tegner Lysholm scores. Preoperative scores were retrieved from the patients’ registry database. Patients were evaluated through clinical assessment and the diagnosis was confirmed through MRI imaging.

Results: Clinically, significant improvements in knee stability have been observed, with most patients resuming daily activities without notable limitations. Postoperative MRI at 12 months confirmed successful graft integration. After four to ten months of physiotherapy, all patients showed improved knee stability and

resumed their normal activities. The use of fresh frozen allografts proved to be a highly effective approach, which facilitated a more efficient and accelerated recovery. Clinical scores indicate good results, as reflected by the IKDC scores, which improved from 1.0 preoperatively to 2.0-4.0 postoperatively. Additionally, total IKDC scores increased from 31.0 to 69.0, while the Lysholm score rose from 48.0 preoperatively to 73.6 postoperatively, and the KOOS score improved from 42.9-47.6 to 63.1-89.3.

Conclusions: *Multiligament reconstructive surgery coupled with postoperative physiotherapy proves essential for restoring knee stability and function. Our study highlights the long-term benefits of early intervention and fresh frozen allograft integration, particularly in Eastern Europe, filling a gap in the existing literature. These findings underscore the critical role of combined surgical and rehabilitation approaches in treating complex knee injuries.*

Keywords: multiligament, knee, reconstruction, instability, allograft.

SECTION I – ORAL PRESENTATIONS

I.3. RESIDENTS

Orthopedic Management of Charcot Foot: Challenges and Outcomes in Patients with Retinopathy and Renal Pathology

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ABSTRACT

Introduction: Charcot foot is a severe condition that poses significant challenges in orthopedic management. Beyond the localized bone and joint issues, its association with systemic conditions like diabetic retinopathy and chronic kidney disease (CKD) is often overlooked. The present study aims to explore these systemic implications from an orthopedic surgeon's perspective, highlighting the need for a more comprehensive management approach.

Objectives: This study seeks to examine the prevalence of retinopathy, nephropathy and CKD in patients with Charcot foot and to evaluate the impact of these comorbidities on the progression and treatment outcomes of Charcot foot.

Material and methods: We conducted a retrospective analysis of 41 patients diagnosed with Charcot foot between 2015 and 2023 in a tertiary care center. We collected data regarding patient demographics, the presence of retinopathy and nephropathy or CKD, treatment modalities, surgical interventions and clinical outcomes. Statistical analyses were performed to determine the correlation between the presence of systemic conditions and the prognosis of Charcot foot.

Results: Our study included 41 patients diagnosed with Charcot foot. Among them, 15 subjects (36.6%) had nephropathy or chronic kidney disease (CKD) and 18 patients (43.9%) had retinopathy. Of the 41 participants, nine (22%) experienced poor outcomes. Notably, all nine patients with poor outcomes had retinopathy, of whom five subjects underwent surgery; also, all surgical patients with poor outcomes had nephropathy or CKD. Among the 32 patients with good outcomes, those with retinopathy, nephropathy or CKD experienced longer recovery times, regardless of whether they were treated orthopedically or surgically.

Conclusion: The management of Charcot foot in patients with retinopathy and kidney damage is significantly more challenging, necessitating a more comprehensive approach. Early detection of these systemic conditions, along with close collaboration between orthopedic surgeons, diabetologists and nephrologists, is crucial in the early detection of Charcot foot and the improvement of patient outcomes. The present study highlights the importance of a multidisciplinary approach to the treatment of Charcot foot, particularly in patients with significant systemic comorbidities.

Keywords: Charcot foot, retinopathy, nephropathy, diabetes.

Treatment Algorithms in Degenerative Meniscus Tears

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ABSTRACT

Objectives: Most common meniscal lesions occur at the medial meniscus and the pattern being often complex but patterns like longitudinal, horizontal, radial and flap tears are also observed. Injuries or meniscectomy can lead to decreased meniscal function and an increased risk of osteoarthritis. To preserve meniscal function, repair should be considered the first option in case of an injury. Taking into consideration the above-mentioned statements, this presentation aims to emphasise the different meniscal repair techniques and how they can apply in a degenerative tear scenario.

Material and methods: This presentation reviews the current literature meniscus repair treatment algorithms that can apply for the degenerative tears. The different meniscal repair techniques, including "inside-out", "outside-in" and "all-inside", and root repair, are described as a viable option for preserving the joint and delaying the conversion of total knee arthroplasty (TKA). Although re-intervention rates are higher after meniscal repair compared to partial arthroscopic meniscectomy, long-term studies have shown that meniscus repair provides better clinical outcomes and less severe degenerative changes in osteoarthritis. Among numerous factors that can be taken into account, the most important ones include patients' age and life expectations, severity of osteoarthritis, presence of mechanical symptoms and response to non-operative treatment.

Results: Degenerative meniscal tears are common and their prevalence increases with age and severity of concurrent osteoarthritis. For example, the prevalence of meniscal tears in individuals aged 50-59 is approximately 25%, while in those aged 70-79 it reaches about 45%. Both clinical and radiographic examinations were used for diagnosis. X-rays are useful for assessing osteoarthritis or other pathologies, while magnetic resonance imaging (MRI) is more accurate for meniscal lesions.

Not all degenerative meniscus tears cause symptoms; so, the presence of pain cannot be directly attributed to the meniscal tear, even if it is considered unstable.

When a degenerative meniscus tear is identified, a non-operative approach should be considered for initial treatment focusing on pain management, physical exercises and lifestyle modifications. Surgical intervention may be considered if non-operative treatment fails for a period longer than three months, according to the ESSKA consensus, especially in patients with mechanical symptoms such as knee locking.

Biological augmentation such as bone marrow stimulation, platelet-rich plasma, fibrin clot and stem cell therapy have broadened the indications for meniscus surgery. However, evidence supporting the superiority of surgery over non-operative treatment is limited.

Conclusion: *Degenerative meniscus tears are a common knee pathology and their treatment requires an individualized approach. It is important to consider all relevant factors, including age, severity of osteoarthritis and response to non-operative treatment, to determine the best therapeutic option for each patient.*

Keywords: knee, degenerative meniscus, repair, augmentation, meniscectomy.

Management of Recurrent Chondrosarcoma in the Knee Joint: a Case Report

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ABSTRACT

Objectives: In the present study, we discuss the case of a patient with a history of resected popliteal chondrosarcoma, who regrettably experienced a recurrence within a year and subsequently sought further treatment in our clinic. Chondrosarcomas constitute a heterogeneous group of primary bone cancers characterized by hyaline cartilaginous neoplastic tissue. They are the second most common primary bone malignancy. Knee chondrosarcoma, a rare and aggressive form of bone cancer, primarily affects the cartilage of the knee joint.

Materials and methods: A 36-year-old female patient, with a documented history of chondrosarcoma in the popliteal space of the left knee, which was previously resected in March 2023, came to our clinic with a recurrence of symptoms. She reported notable pain and partial functional impairment in the left knee, marked by restricted flexion and a persistent sensation of pressure within the joint. Following an extensive clinical examination, palpation revealed a tumor formation in the posterolateral region of the left knee, approximately 5 cm in size, with the patient reporting increased sensitivity in that area and experiencing pain during both active and passive flexion-extension movements of the knee joint. Combined with the results of paraclinical investigations, including magnetic resonance imaging (MRI), computed tomography (CT) and CT angiography of the left knee, a diagnosis of chondrosarcoma recurrence was established.

Results: The surgical intervention conducted in February 2024 featured a marginal resection of the chondrosarcoma through a posterior approach. This procedure involved the meticulous isolation of the vascular bundle and neurolysis of the sciatic nerve. Additionally, four specimens were carefully harvested for histopathological analysis. After surgery, the patient was initiated on an extensive therapeutic regimen, including analgesics, anti-inflammatory agents, anticoagulants, and prophylactic antibiotics, complemented by a comprehensive functional rehabilitation program. The course of recovery has been markedly favorable.

Conclusions: The case described by us underscores the importance of early detection and thorough clinical evaluation. The surgical approach employed, involving marginal resection and careful management of surrounding anatomical structures, highlights the necessity of balancing oncological control with functional preservation. Postoperative care, including a comprehensive rehabilitation program and a multifaceted pharmacological regimen, has facilitated a favorable recovery trajectory.

Keywords: chondrosarcoma, knee surgery, tumor resection, popliteal neoplasm.

SECTION II – POSTER PRESENTATIONS

Radiological Measurements of the Lateral Acromial Angle in Patients with Rotator Cuff Tears: a Retrospective Study

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ABSTRACT

Objectives: The lateral acromial angle (LAA) was first described in 1995 by Banas. The angle is measured using two lines: one is drawn just inferior to the sclerotic line of the acromion undersurface and the second line connects the superior and inferior border of the glenoid fossa. Values of the LAA lower than 78 degrees are associated with a higher prevalence rotator cuff disease. Originally described on magnetic resonance imaging (MRI), this measurement has since been utilized by other authors on true antero-posterior (AP) radiographs. However, no study has yet described a difference between measuring the LAA on MRI or true AP radiographs, nor has evaluated the importance of scapular kinematics in influencing the value of this angle.

Materials and methods: The clinical data of 610 patients with shoulder pain who came to our clinic between January 2018 and March 2023 were retrospectively analyzed. After applying the inclusion and exclusion criteria, 50 patients were eligible for the final study population. Subjects had a mean age of 54.5 ± 9.8 years (age range 29-74 years) and 54% of them were females. Of the 50 participants, 23 (64%) had a full-thickness rotator cuff tear and 17 (34%) partial rotator cuff tears (17, 34%), which were diagnosed on a shoulder MRI. All patients had a true AP radiograph of the shoulder taken in our institution. We measured the lateral acromial angle of all 50 patients on MRI and true AP radiograph.

Results: The Wilcoxon signed-rank test showed a significant difference in LAA measurements between MRI and true AP radiographs, with MRI granting higher values (median 77.57°) compared to radiographs (median 73.05°), and a median difference of 4.84° . Pearson correlation indicated a moderate correlation between the two methods. The intraclass correlation coefficient (ICC) suggested moderate to good agreement, but with notable variability. A Bland-Altman plot was used to assess the agreement between the two measurement techniques.

Conclusions: Magnetic resonance imaging provides significantly higher LAA measurements compared to true AP radiographs. Scapular kinematics likely influence these differences, making the measurements from MRI and radiographs not perfectly interchangeable with a potential impact on clinical decision making.

Keywords: lateral acromial angle, scapular kinematics, shoulder angle.

Relationship between Vitamin D Status and Clinical Outcomes after Anterior Cruciate Ligament Reconstruction: a Systematic Review

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ABSTRACT

Objectives: Notwithstanding the progress in surgical methodologies and rehabilitation protocols, the efficacy of anterior cruciate ligament (ACL) reconstruction exhibits considerable variability across patients. Emerging evidence indicates that vitamin D status may exert a significant influence on these outcomes. Adequate levels of vitamin D are paramount for musculoskeletal health; conversely, deficiency has been linked to muscular weakness, compromised neuromuscular function and an increased risk of injury. This systematic review aims to explore the potential implications of sustaining optimal vitamin D levels in enhancing surgical outcomes, augmenting rehabilitation effectiveness and mitigating complications subsequent to ACL reconstruction (ACLR).

Material and methods: A literature search using the 2020 PRISMA guidelines was performed by querying PubMed, Web of Science, Cochrane and Scopus databases from database inception through June

2024. Search terms included “anterior cruciate ligament”, “reconstruction” and “vitamin D”. Evidence level 1 to 4 human clinical studies in English that reported outcomes after ACLR were included. Of the 240 studies that were initially identified, five met all inclusion criteria.

Results: The five studies eligible for the present systematic review included two retrospective cohort studies, two prospective cohort studies and one cross-sectional study. The selected studies explored various aspects, including the impact of vitamin D on muscle strength recovery following ACL surgery and the association between vitamin D levels and ACL injury incidence. The findings indicate that vitamin D deficiency is linked to an increased risk of ACL injury and may negatively affect postoperative recovery. Nevertheless, the evidence regarding its effect on functional outcomes after ACL reconstruction remains inconclusive, though some studies suggest that maintaining adequate vitamin D levels may support muscle strength recovery. This systematic review highlights the crucial role of vitamin D in maintaining musculoskeletal health, with a particular focus on ACL injuries and recovery. Sufficient vitamin D levels are associated with a reduced risk of ACL injuries and better muscle strength recovery post-surgery. However, the evidence on its effects on overall functional outcomes remains inconclusive. Further research is needed to explore whether vitamin D supplementation could improve recovery and act as a preventive strategy in managing ACL injuries.

Conclusion: Optimal vitamin D levels have been suggested to lower the risk of ACL injuries and enhance postoperative muscle recovery. However, current evidence regarding its influence on broader functional outcomes remains inconsistent, underscoring the need for further research to clarify its potential role in ACL injury prevention and rehabilitation strategies.

Keywords: anterior cruciate ligament reconstruction, injury risk, muscle recovery, rehabilitation, vitamin D.

Treatment of Bone Cyst of the Talar Body: a Case Report

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ABSTRACT

Objectives: The main objective of this study is to show how rare talar cysts are, how difficult they are to diagnose, how easy it is to confuse them with bone tumors (giant cell tumors) or aneurysmal bone cysts, and how often they are associated with osteochondral lesions and risk of pathological fracture. Another important aspect is related to the surgical technique because we have a narrow surgical field, a poor blood supply and a complex anatomy of the talus (the entire talar body being covered by cartilage).

Materials and methods: We present the case of a 38-year-old female patient who came to the emergency room for functional impotence and pain in the ankle, which occurred one week ago without an injury. Following the clinical and imaging investigations, including x-ray scan and computed tomography (CT) scan, we diagnosed a cyst of the talus bone. There are two approaches to cysts: arthroscopic and open. In this case, for a better approach of the cyst, we chose invasive surgery with peroneal osteotomy. With the patient placed in a lateral position, we made a 2 cm incision from the talonavicular joint to the medial malleolus. Next, we resected the cyst in normal bone (1-1.5 mm safety edge). Afterwards, we grafted the remaining bone loss with a fibula graft (autograph) and fixed the graft with two resorbable screws. Finally, we did an osteotomy of the peroneal with a plate and screws. Follow-up included radiological and clinical examination as well as CT scans 3-6 weeks after surgery.

Results: Postoperative clinical exams, x-rays and CT scans at specific time intervals showed that the patient's evolution was favorable. The wound had a perfect appearance and the graft integration was good. At present, the patient does not present any symptoms or problems with her leg and she is living a normal life.

Conclusions: The cysts of the talar body are often undiagnosed, which may lead to pathological fracture, osteochondral lesion and damage of the articular cartilage. The best approach to our case, with a positive result, was invasive surgery (debridement and grafting). The patient's perfect recovery, good clinical outcome and absence of postoperative complications at six weeks postoperatively highlight the effectiveness of the surgical technique employed by us. The choice of surgical approach between an open and an arthroscopic operation is case-based, taking into account the quality of the bone, the bone defects, the size and positioning of the cyst.

Keywords: talar cysts, osteotomy, graft, invasive surgery, approach.



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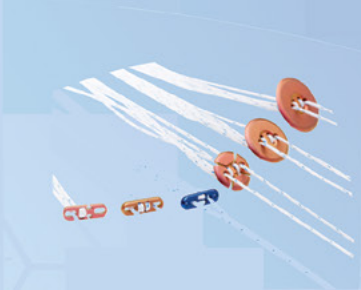
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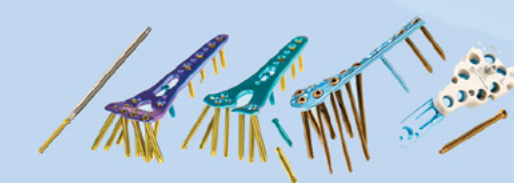
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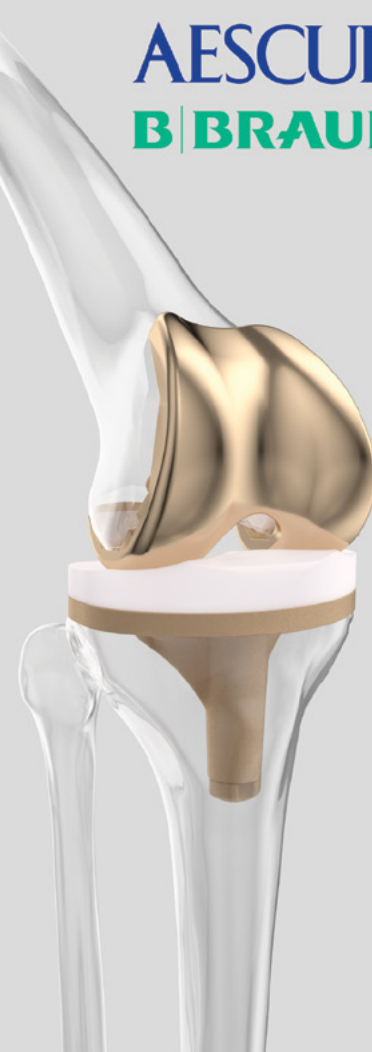
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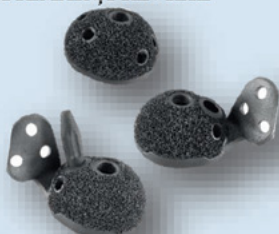
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