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## ABSTRACT BOOK

## Posters

## Dry Knee Arthroscopy with Carbon Dioxide (CO<sub>2</sub>) Insufflation for Anterior Cruciate Ligament (ACL) Reconstruction

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Anterior cruciate ligament (ACL) injuries are commonly treated through orthopedic surgery, with traditional procedures relying on arthroscopy using fluid as the medium. However, dry arthroscopy has emerged as a potentially advantageous alternative technique. This method allows the knee joint to remain dry, reducing the risk of fluid leakage and enabling a more precise surgical visualization, resulting in shorter operation times and fewer complications. Recent research has highlighted the benefits of carbon dioxide (CO<sub>2</sub>) insufflation during ACL reconstruction, which can decrease pain and discomfort during early recovery. This article introduces a technique for performing ACL reconstruction that eliminates the need for arthroscopic fluid for visualization or instrumentation. Based on CO<sub>2</sub> insufflation, this technique shows promise as a viable alternative to traditional fluid distention methods.

## A comparison of continuous cold flow and compression device and traditional icing regimen and no icing following anterior cruciate ligament reconstruction: A pilot study

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The aim of this study was to investigate the effectiveness of continuous cold flow and compression device as against traditional icing regimen and without icing after anterior cruciate ligament (ACL) reconstruction. All patients undergoing ACL reconstruction from June 2021 to August 2021 were enrolled in this study. Patients were randomly allocated to three groups: A control group (n=10) with no ice regimen post-operatively, a second control group (n=10) with ice bag, and a third group (n=10) with continuous cold flow and compression device (physiolab). All patients who had isolated ACL tear evident on magnetic resonance imaging were included. Pain intensity, limb girth, Oxford Knee Score, and 12-item survey form were measured pre- and post-operatively. Significant difference was noted between pain scores in all groups at two- and six-week follow-ups with p-value of 0.004 and 0.01. The test for "between subject effects" showed significant difference (p=0.007) in limb girth between the two groups. Cold and compression device can be used to reduce swelling immediately after ACL reconstruction.

## Platelet rich plasma in the treatment of patellar tendinitis

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We present a case of a 42-year-old active male with from chronic patellar tendinitis, refractory to conservative. Despite rigorous physiotherapy and NSAIDs, the patient's persistent pain and functional limitations prompted a surgical approach. Opting for fibrous tissue debridement coupled with Platelet-Rich Plasma (PRP) therapy, our intervention yielded good clinical results. The procedure involved meticulous removal of inflammatory tissue in the patellar tendon and the strategic application of PRP to enhance healing. Following the intervention, the patient experienced a significant reduction in pain, improved range of motion, and a swift return to his active lifestyle.

Anatomopathological study yielded no malignous suspicion. This clinical case highlights the effectiveness of PRP therapy in the management of recalcitrant patellar tendon tendinitis but also emphasizes the importance of personalized treatment strategies in orthopedic practice.

## Multiligamentous Knee Injury Patterns with Associated Injuries 15-year experience at a Level I Trauma Center

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**Purpose** This study aimed to compare the incidence rates of concomitant injuries, including meniscal and cartilage injuries, between multiligamentous knee injuries (MLKI) with and without dislocation based on our 15-year experience of knee dislocation and MLKI at a level 1 trauma center.

**Methods** We retrospectively identified 100 patients (115 knees) with MLKIs and/or dislocations at our trauma center between 2007 and 2021. MRI was routinely performed to evaluate the injured structures and extent of injury. The anatomic structures of the knee were categorized into ACL, PCL, medial and posterolateral structures, and further classified according to the Schenck classification. The study participants were divided into two groups: 40 and 75 knees classified as MLKI with and without dislocation, respectively.

**Results** MLKIs with and without dislocations showed a significant discrepancy in the patterns of meniscal tears. For medial meniscal tears, radial tears were more prevalent in MLKIs with dislocation, and longitudinal tears in MLKIs without dislocation. For lateral meniscal tears, anterior horn or totally detached tears were more prevalent in MLKIs with dislocation, and radial tears in MLKIs without dislocation. Additionally, complete rupture of all four major ligaments was found in 38% of the cases with dislocation, with the majority showing complete ruptures of both the ACL and PCL. Concomitant serious injuries, such as popliteal artery injury and fractures, were observed only in cases involving high-energy trauma and dislocation.

**Conclusions:** MLKIs with dislocation demonstrate distinct patterns of ligament damage and meniscal tears compared with MLKIs without dislocation.

## Early Medial Reconstruction Combined with Severely Injured Medial Collateral Ligaments Can Decrease Residual Medial Laxity in Anterior Cruciate Ligament Reconstruction

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**Introduction:** This study aimed to describe an anatomic medial knee reconstruction technique for combined ACL and grade III MCL injuries and to assess knee function and stability restoration in patients who underwent primary MCL reconstruction compared with primary repair.

**Methods:** A total of 105 patients who had undergone anatomic ACL reconstruction between 2008 and 2017 were enrolled in this retrospective study and divided into two groups according to concomitant MCL ruptures. Group A included isolated ACL ruptures without MCL injuries. Group B included both ACL and MCL injuries, and it was subdivided into three groups according to the severity of MCL injury and treatment modality: B-1, grade I or II MCL injury treated conservatively; B-2: grade III MCL injury treated by primary MCL repair; and B-3: grade III MCL injury treated by primary reconstruction.

**Results:** At 6 months postoperative, there was no significant difference in medial laxity between the B-2 and B-3 groups. However, at 2 years postoperative, medial laxity were significantly higher both at 30° of flexion (5.2° vs. 2.2°,  $p = 0.020$ ) and at full extension (3.4° vs. 1.1°,  $p < 0.001$ ) in patients in B-2 group compared to those in B-3 group. There were no statistically significant differences between the two groups with respect to Lysholm scores, Tegner activity levels, Likert scales (satisfaction), and returning to previous sports at the 2-year follow-up.

**Conclusion:** Primary medial reconstruction combined with severely injured MCL in ACL reconstruction may decrease residual medial laxity more than primary repair.

## One-year functional outcomes in anterior cruciate ligament reconstruction with Internal Brace in the All-inside Graftlink technique with allograft by arthroscopic approach.

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**Introduction:** The anterior cruciate ligament (ACL) is an intra-articular and extrasynovial structure with limited vascularization. Its rupture has an incidence of 1 in 3,000 in the United States, with a rate of 250,000 ruptures per year. Peak incidence occurs between the ages of 16 and 39. ACL injuries often occur with concomitant knee injuries. The treatment goals for ACL rupture are to restore short-term joint function and prevent degenerative pathology in the long term. Surgical techniques using allografts require structural support, especially during the first postoperative year, for which the augmentation with internal brace has been developed and studied in biomechanical models and clinical settings, suggesting it as an intervention that potentially reduces the risk of recurrence. **Study Method:** We conducted a prospective comparative study on patients with ACL rupture requiring surgery using the All-inside Graftlink technique with allograft. The objective was to analyze differences based on the implementation of internal brace in 13 patients and without it in 22 patients. **Results:** We observed a functional improvement with internal brace augmentation, with statistical significance below 0.005 from the first month, persisting throughout the year with corresponding cohort points. **Conclusions:** This study demonstrates that patients with ACL rupture requiring invasive treatment, the surgical technique with allograft implemented with internal brace is an added benefit to improve the impact on allograft during rehabilitation. Considering sports demands and the association of concomitant injuries, this surgical technique is highly recommended for enhancing patient-perceived functionality and minimizing the impact suffered by the allograft during recovery.

## Lateral meniscus transplant with allograft, a good alternative for the management of postmeniscectomy syndrome in young patients.

### Presentation of a case.

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Meniscal injuries represent one of the main causes of intra-articular knee pain, especially in young patients, athletes or those with a high demand for physical activity; representing a challenge for the arthroscopist surgeon due to the great complexity that some of these injuries can present. Although our priority is to preserve as much of the meniscus as possible, there are cases in which the injury reaches such complexity that this is impossible, with partial or total meniscectomy being the only therapeutic option. In the United States, approximately 690,000 partial meniscectomies are performed each year. This situation makes us consider meniscal transplantation as a great therapeutic option for patients considered young enough for joint replacement. The ideal patient is a relatively young patient (between skeletal maturity and 50 years), who has a well-documented history of partial or total meniscectomy, pain well localized to the affected compartment, with failure to conservative treatment and without high-grade chondral defects in a generalized way along the knee compartments. We present the case of a 35-year-old male patient with a history of total meniscectomy of the right lateral meniscus 7 years ago, who currently presents with a postmeniscectomy syndrome of the lateral compartment. Due to the clinical and demographic characteristics of our patient, as well as the findings in the imaging studies, meniscal transplantation with allograft represents an excellent alternative to alleviate the symptoms and slow down as much as possible the need for joint replacement as a definitive treatment.



## Comparative analysis of the treatment of subchondral bone marrow edema in stress overload of the knee joint (SOKJ) syndrome by platelet-rich plasma (PRP) and sodium hyaluronate (SH) injection.

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**Background:** The aim of the study was to investigate the effect of PRP and SH on subchondral bone marrow edema in knee stress overload syndrome. **Methods:** 64 patients with symptomatic knee stress overload were randomised into two groups. 38 patients underwent three intra-articular injections of platelet-rich plasma (PRP) with a frequency of 1 time per week. 26 patients underwent intra-articular injection of sodium hyaluronate with the same frequency. Clinical effects were evaluated using the Western Ontario and McMaster University Osteoarthritis Index (WOMAC), visual analogue scale (VAS), and Lecken functional index. Changes in bone marrow subchondral edema were assessed by magnetic resonance imaging (MRI) before and after treatment. **Results:** All patients completed treatment and were followed up for 12 months. After treatment, the WOMAC and VAS scores in both groups decreased significantly, and the difference was statistically significant at different time points ( $P < 0.05$ ). The WOMAC score showed the maximum decrease in 1 month. Lecken's index in patients after 1 month of treatment indicated an improvement in quality of life. VAS and WOMAC scores in the PRP group were better than in the SH group ( $P < 0.05$ ). MRI showed that bone marrow subchondral edema was reduced to varying degrees in both groups, with a more pronounced reduction in the PRP group ( $P < 0.05$ ). **Conclusions:** Intra-articular injection of PRP can significantly reduce the level of subchondral bone marrow edema and improve the condition of patients with symptomatic stress knee overload syndrome.

## Medial collateral ligament reconstruction to augment thinned medial collateral ligament without knee instability

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Medial collateral ligament (MCL) injuries are one of the most common knee ligament injuries. MCL reconstruction is rarely indicated for isolated MCL injuries without instability. A 34-year-old male who was recreational soccer and jujutsu (martial arts) player presented with chronic right knee pain during sports activities after an MCL injury without knee instability. Conservative therapies for more than one year were ineffective. Stress radiographs showed no valgus stress instability in his right knee. Magnetic resonance imaging (MRI) revealed partial thinning of the superficial MCL and underlying bursitis. Only echo-guided injection of local anesthesia into bursa relieved his pain, but only temporary pain relief was obtained. After diagnostic arthroscopy without any intraarticular lesions, single-bundle MCL reconstruction with the semitendinosus tendon was performed. The patient regained activity to the preinjury level two-year after surgery. He fully returned to soccer and jujutsu. Lysholm knee score was improved from 3 to 7. In total knee injury and osteoarthritis outcome score (KOOS), sports and QOL scales improved from 65 and 44 to 85 and 88, respectively. Post-operative MRI showed that the transplanted tendon was integrated with the original superficial MCL, and recurrence of bursitis was not observed. In conclusion, MCL reconstruction can be considered to treat chronic isolated MCL injuries with persistent pain even when it does not cause gross knee instability.

## Effect of VMO function on residual extensor lag in patients undergoing ACL Reconstruction

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Introduction: there is a popular conception amongst surgeons that VMO function is essential for terminal extension . Objective : to test the incrimination against VMO and its effect on residual knee extensor lag . Methods : 12 patients with residual extensor lag at 12 weeks underwent clinical and EMG testing for VMO function . Results - in none of the patients did the VMO allow patellar subluxation, nor was their EMG evidence of selective VMO loss of function . Discussion: in patients with extensor lag regaining girth and function of the entire quadriceps as a whole recovered terminal lag . Conclusion - VMO may not be the agent responsible for terminal extensor lag following knee arthroscopy surgery

## Patients' Joint Perception in Anterior Cruciate Ligament Reconstruction Patients

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**Objective:** To validate and compare the Patients' Joint Perception (PJP) with other commonly employed patient-reported outcome measures (PROMs) in a cohort of patients following anterior cruciate ligament reconstruction (ACLR). **Methods:** A retrospective study of 108 patients who underwent ACLR between 2017 and 2021, with complete data for visual analogous scale (VAS) pain, PJP, forgotten joint score (FJS), Tegner, Lysholm, Anterior Cruciate Ligament Return to Sport After Injury (ACL-RSI), Single Assessment Numeric Evaluation (SANE), Cincinnati Knee Rating System (CKRS), and The Hospital for Special Surgery Anterior Cruciate Ligament Satisfaction Survey (HSS-ACL-SS) scores at a mean follow-up of 3 years. Spearman's rank-order correlation was employed to determine the correlations between clinical scores, and Receiver Operating Characteristic (ROC) curve analysis was conducted to assess the discriminatory power of the chosen PROMs. **Results:** PJP demonstrated significant correlations with all the reported PROMs, suggesting its potential as a valid and reliable assessment tool for evaluating ACLR outcomes. ROC curve analysis showed a good area under the curve (AUC) for identifying natural joint perception using various PROMs. Ceiling effect analysis revealed a nearly 20% ceiling effect for PJP, which is deemed satisfactory. **Conclusion:** This study validates the PJP as a reliable and useful tool for assessing patient outcomes following ACLR. Its significant correlation with other established PROMs underscores its potential as a valuable addition to the existing array of assessment methods in ACLR.

## Navigating ACL Injuries Amid the COVID-19 Pandemic:

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**Introduction:** In UK, diagnosing anterior cruciate ligament (ACL) injuries is a recognized challenge, often leading to extended diagnostic delays. The COVID-19 led to reduced surgical capacities, creating a backlog of patients awaiting necessary surgical interventions. This study evaluates the impact of COVID-19 on the timeline from ACL injury diagnosis to MRI and surgical intervention, with a specific focus on an internal acute knee clinic pathway designed to expedite the evaluation, diagnosis, and management of soft tissue knee injuries. **Methods** In this cross-sectional study, we retrospectively reviewed all the patients who underwent primary ACL reconstruction from 2019 to 2022. Patients were divided based on the date of operation to pre- and post-COVID, and outcomes were compared to see the possible effects of COVID-19. **Results** Our cohort included 97 patients, and the mean age of patients was 30.6 years (17-53 years). The median time of injury-to-MRI was 46.5 days during the pre-COVID period, which decreased to 44 days in the post-COVID period. The median time of injury-to-surgery was 287.5 days during the pre-COVID period, which increased to 289 days in the post-COVID period. The median MRI-to-surgery duration was 200 days during the pre-COVID period, which increased to 225 days in the post-COVID period. Around 35% of patients had an MRI prior to getting evaluated by a specialist. **Conclusion** The study showed that the delay from ACL injury to subsequent surgery actually reduced post-pandemic due to hospital-based acute knee pathway which is essential as majority of patients have associated meniscal injury.

## Fresh Osteochondral Allograft Treatment with Massive Osteochondral Defect; Case Series and a Preliminary Report in Turkiye

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**Introduction:** Large and complex chondral lesions of the knee are common. Several surgical techniques are described in literature for chondral lesions, such as microfracture, autologous osteochondral transplantation, autologous chondrocyte implantation, and fresh osteochondral allograft (OCA). We aim to present short-term clinical and radiological outcomes of the fresh OCA transplantation and describe the surgical technique. **Case:** Between July 2019 and June 2023, 11 fresh OCA transplantation procedures were performed. 10 patients with a minimum of 1 year follow-up period were included. All patients' information was shared with Ministry of Health Tissue Transplant Department and permission was obtained for transplantation. Tissues were harvested from donors from Turkiye. Serological tests and preservation of the tissues were performed by a tissue bank. Patients were examined to note their joint function and overall satisfaction using the IKDC and KOOS scores and VAS scale. MRI was evaluated preoperatively, postoperatively, at >12 months follow-up. **Outcomes:** The mean graft area was 5.1cm<sup>2</sup>. The mean IKDC score improved from 37.5 to 65.4 at the final follow-up (average 20 months). The mean KOOS score improved from 38 to 69.6. The mean VAS score improved from 6 to 1.6. There was no graft failure. **Discussion:** We conclude that fresh OCA is a useful salvage treatment option and is promising for the treatment of the large osteochondral defects of the knee. The availability of allograft was a great concern. A small series was one of our limitations. Nevertheless, this small cohort is important to be the first fresh OCA series in Turkiye.

## Anterior menisofemoral ligament of the medial meniscus – case report

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The menisofemoral ligaments connect the posterior root of the lateral meniscus to the medial femoral condyle, with common variants including the Ligament of Humphrey and the ligament of Wrisberg, whether it passes anterior or posterior to the posterior cruciate ligament (PCL). These structures, present in over 90% of cases, play a vital role in the dynamic stability of the knee joint during motion. Regarding the attachment patterns of the root of the anterior horn of the medial meniscus, the most frequent attachment is found at the flat intercondylar region of the tibial plateau. A less common pattern involves attachments to the anterior cruciate ligament (ACL) or other ligaments.

We report a rare variant, observed in less than 1% of arthroscopies in most large studies, the anterior menisofemoral ligament of the medial meniscus (AMLMM) which attaches to the intercondylar notch anterior to the ACL. Although typically asymptomatic, the presence of the AMLMM may contribute to hypermobility of the anterior horn of the medial meniscus, likely due to the absence of a firm osseous attachment to the proximal tibia. Given its potential role in medial meniscal stability and biomechanics, routine excision of the AMLMM during arthroscopy is not recommended. This underscores the importance of recognizing and understanding this anatomical variant in knee pathology and surgical management.

## Meniscal lesions in ACL deficient Knees, two years after: Incidence, mapping and types.

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**Introduction :** The optimal timing of ACL reconstruction depends on several factors, including meniscal lesions that can be associated. These factors participate in functional impact and secondary arthritis. Our study focuses on the meniscal lesions identified and their characteristics in patients who had an ACL reconstruction after a delay exceeding two years. **Methods :** We retrospectively studied 289 patients operated between January 2016 and December 2021 for an arthroscopic ACL reconstruction and identified 73 patients who were operated with a delay greater than 2 years of the initial trauma. A pre-established form was completed for each patient from the medical record, identifying the epidemiological, clinical, radiological and therapeutic characteristics of each patient. The results of the arthroscopic exploration were recorded. **Results :** An incidence of meniscal lesions up to 78% was found in these patients.

A concentration of lesions in the posterior horns of both menisci and especially the internal meniscus (36% of lesions) was noted. Posterior medial ramp involvement was observed in 19% of the cases. The frequency of bucket handle lesions was 28%. A slightly lower repair rate in this population was found with 54% of repairs done. **Conclusion :** The frequency of meniscal lesions associated with ACL ruptures older than 2 years is an argument in favor of an early reconstruction. A careful exploration of the different meniscal segments must be carried out in this population, with particular attention to the posterior compartments.



## Comparison of clinical and biomechanical results of arthroscopic rotator cuff repair using conventional and triple-row suture-bridge techniques

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**Background:** The suture-bridge technique, with its various modifications, is frequently utilized in rotator cuff tear repairs. This study aimed to compare the clinical and biomechanical outcomes of the arthroscopic conventional and the triple-row suture-bridge techniques (SBT) to evaluate which technique demonstrates superior biomechanical properties.

**Methods:** A retrospective evaluation was conducted on 62 patients who underwent arthroscopic rotator cuff repair using either conventional or triple-row SBT from January to December 2019. Clinical evaluations were conducted preoperatively, and at 1 and 2 years post-surgery using the various shoulder scores. Magnetic resonance imaging was performed before surgery, and the postoperative rotator cuff integrity was evaluated 6 months after surgery. Mechanical testing was also performed, applying both conventional and triple-row SBT. These specimens underwent horizontal and vertical axial load tests on a material testing machine, and the ultimate failure load was measured.

**Results:** Both techniques significantly improved the clinical outcomes at postoperative 1 and 2 years, with no significant difference between-group ( $p > 0.05$ ). The retear rate was 19.2% in the conventional group and 11.1% in the triple-row group, but the difference was not statistically significant. The failure load of the triple-row SBT was higher than that of conventional suture-bridge technique.

**Conclusion:** Both the conventional and triple-row SBT are effective in achieving favorable clinical outcomes for full-thickness rotator cuff tear repairs. Although the triple-row technique suggested a potential for a reduced retear rate, the difference was not statistically significant. However, the triple-row SBT showcased superior biomechanical properties when compared with the conventional technique.

## Post Operative Rotator Cuff MRI & Shoulder Function : Were we missing something right in front of our eyes ?

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Introduction: Post operative rotator cuff MRI evaluation is a difficult task . Even after 6 months to 1 year post op the imaging findings may not become “ normal “ . Furthermore , correlation of healing of the surgical site and functional recovery has eluded clinicians. The rotator cable is the functional bridge like structure responsible for weight bearing by the cuff .Objective : To assess the result of the reconstitution of the structural integrity of the rotator cable on shoulder function by comparing MRI evidence of the former with shoulder function . Methodology: Retrospective Analysis .MRI identification of patient specific rotator cable integrity loss pre op . Documentation of Post Op achievement of structural integrity. Correlation with clinical finding / Quick Dash score . Patients were divided into two groups at 1 year follow with fresh MRI - those with evidence of rotator cable healing and those without . The two groups were further divided into 2 subgroups- those with clinically evidenced regain of function and those without . With the 2x2 table generated an odds ratio was calculated to see if healing of rotator cable affected post op shoulder function in the absence of other pathology. Result : Odds Ratio was  $> 1$  . Discussion : Rotator cable model is a widely acceptable biomechanical theory . Imaging evidence of its integrity may correlate with shoulder function . Conclusion : Healing of rotator cable is equivalent to post operative shoulder function .

## Mini-open rotator cuff repair is safe, effective surgical procedure – a prospective study

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Introduction- Rotator cuff tear causes a significant disability and if left untreated leads to rotator cuff arthropathy. Prevalence of asymptomatic degenerative tear is twice that of symptomatic. Incidence of rotator cuff has two peaks, one is traumatic in younger population and degenerative in population above 50, which increases with age. Material and method- we treated 78 patients of degenerative symptomatic rotator cuff tear from January 2020 to December 2022. Patients were treated with interscalene block with nerve locator in beach chair position. We had used head lamp, suture passer, grasper and other arthroscopic devices for better negotiation of suture. We used two double loaded suture anchors with single row repair. Results- Minimum one year follow up done for the patients. ULCA scoring done at 6 months and one year follow up and compared with arthroscopic repair with other study, results were comparable to the arthroscopic group. Conclusion- Arthroscopic rotator cuff repair is a surgically demanding procedure with an equipped centre. Time duration of surgery and general anaesthesia in older population is also a concern. Mini-open rotator cuff repair done in regional block done in relatively less time without any complex positioning, beach chair gives more anatomic orientation to the surgeon. Results of mini open repair are equally comparable to arthroscopic repair. Key words- rotator cuff tear, Mini-open, arthroscopic repair, ULCA

## Unique Location of Ganglion Cyst on the Shoulder

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Ganglion cysts can be found in surrounding tissues of the shoulder. They are often accompanied by paralabral problems. So far, a very rare case (only 1 case) of ganglion cyst originating from the lateral portal after shoulder arthroscopy has been reported. We aim to present a ganglion cyst at a rare location. A 56-year-old woman underwent shoulder arthroscopy due to a rotator cuff tear in her right shoulder. Her medical history was unremarkable except for two previous right shoulder arthroscopic procedures. She had her first surgery in 2010 for a partial rotator cuff tear, SLAP lesion and impingement and her second surgery in 2016 was for a full thickness rotator cuff tear. Last surgical procedure for re-rupture of the rotator cuff tendon, 2023, was carried out with 3 standard portals: anterosuperior, lateral and posterior. 6 weeks after the surgery, the clinical findings were satisfactory and physical therapy started to increase the range of motion. Two weeks after the start of physical therapy, the patient presented to our orthopedic clinic with complaints of pain during movement and local swelling in the operated shoulder area. This swelling was above the lateral arthroscopy portal and was a visible, mobile, soft tissue mass. Infection parameters were normal. Ultrasonography revealed a fluid-filled cyst. Based on clinical and imaging findings, we decided to conduct open excision. The diagnosis of a ganglion cyst was confirmed histologically. The literature review shows no comparable case of a ganglion cyst through an arthroscopy portal after shoulder arthroscopy.

## Comparative Analysis of Generative Artificial Intelligence (AI) versus Manual Data Analysis in Orthopaedic Patient Data

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### Background:

The employment of Generative Artificial Intelligence (AI) in the realm of medical data interpretation has been on the rise. However, its effectiveness in comparison to manual data analysis has been insufficiently investigated.

### Aim:

Evaluate the accuracy and time-efficiency of Generative AI against manual data interpretation within extensive datasets pertaining to patients with orthopaedic injuries.

### Methods:

A dataset of 6,562 orthopaedic trauma patients admitted to a general hospital over two years was scrutinised. The analysis encompassed details of admission, injuries, and the duration taken to assess the data. Two researchers operated independently: one utilised GPT-4 for insights, while the other manually examined the identical dataset employing Microsoft Excel and SPSS® software.

### Results:

Each researcher answered 20 questions based on the dataset. Both GPT-4 and the manual researcher achieved consistent results for 19 out of 20 questions (95% accuracy). After a subsequent review and refined prompts to GPT-4, the answer to the final question aligned with the manual researcher's findings. GPT-4 required just 30 minutes, a stark contrast to the manual researcher's 9-hour analytical duration.

### Conclusion:

This study emphasizes the transformative potential of Generative AI in medical data analysis. GPT-4 not only paralleled the accuracy of manual analysis but achieved this in significantly less time. Our findings underline the significance of prompt engineering. For optimal accurate results, data analysis by AI can be enhanced through human oversight. Adopting AI-driven approaches can bolster efficiency without sacrificing precision. We recommend future investigations to engage larger and more varied datasets to reaffirm these outcomes.

## Improving Patient Comprehensibility with ChatGPT 3.5 Generated Responses for Osteosarcoma Patient Frequently Asked Questions

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Receiving a diagnosis of osteosarcoma is life-altering and patients may have further inquiries. To better understand their medical conditions, patients may turn to increasingly readily available sources of information. We sought to evaluate the appropriateness, applicability to clinical care, and comprehensibility of ChatGPT 3.5 responses for osteosarcoma care. Twenty frequently asked osteosarcoma patient questions were input into ChatGPT. Two independent reviewers assessed the responses for appropriateness, sufficiency for clinical practice, and accuracy. Comprehensibility was assessed with the Flesch Reading Ease Score (FRES) and the Flesch-Kincaid Grade Level test. The questions were re-entered into ChatGPT with a simplified command. New responses were rated with the same scoring systems and a paired t-test was performed. All responses generated were appropriate for the platform. Thirteen (65%) responses were sufficient for clinical practice and seven (35%) responses would be modified. The average accuracy of responses on the Likert scale was 4.5. The original average FRES was 51.8 and the Flesch-Kincaid grade level was 10.51. The new average FRES was 63.3 and the Flesch-Kincaid grade level was 8.27. The paired t-tests showed t-values of -5.306 and 7.134 both at 95% confidence intervals and  $p < 0.001$ . ChatGPT-generated responses may be suitable and accurate for patient concerns. The original responses were of moderate comprehensibility with a higher grade level. The platform was able to adjust responses to enhance comprehension at a lower grade level. With increasing public use, orthopaedic oncologists should be aware of ChatGPT's potential uses and limitations when providing patient education and counseling.

## Evaluating Comprehensibility of ChatGPT 3.5 Generated Spanish Language Responses for Osteosarcoma Queries

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Patients diagnosed with osteosarcoma may have further inquiries following the diagnosis. ChatGPT may assist providers in answering patient questions in a language other than English and independently provide patients with additional information. We aimed to assess the appropriateness, clinical relevance, and comprehensibility of ChatGPT 3.5 Spanish responses for osteosarcoma care. Twenty frequently asked osteosarcoma patient questions in Spanish were input into ChatGPT. Two fluent Spanish reviewers independently assessed the responses for appropriateness, sufficiency for clinical practice, and accuracy. Comprehensibility was assessed with the Flesch Reading Ease Score (FRES) and the Flesch-Kincaid Grade Level test. The questions were re-entered into ChatGPT with a simplified command. New responses were rated with the same scoring systems and a paired t-test was performed. All responses generated were appropriate for the platform. Thirteen (65%) responses were deemed suitable for clinical use, while seven (35%) responses would be modified to be more concise. The average accuracy of responses rated on the Likert scale was 4.6. The original average FRES was 51.6 and the Flesch-Kincaid grade level was 10.29. The new average FRES was 66.1 and the Flesch-Kincaid grade level was 7.2. The paired t-tests showed t-values of -8.3115 and 7.315 at 95% confidence intervals and  $p < 0.001$ . The original responses generated were of moderate comprehensibility with a higher grade level. Modified responses had significantly higher comprehensibility with a lower grade level. With increasing public use, orthopaedic oncologists should be aware of ChatGPT's potential uses and limitations when providing patient education and counseling.

## Evaluating Utility of AI Resources for Creating Literature Reviews in Orthopaedic Oncology

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Literature review is essential to informing research projects however, it can often be labor intensive. The use of artificial intelligence (AI) to aid in summarizing and generating information for research has become a topic of interest. We aimed to assess how ChatGPT 3.5 performs in generating literature reviews on orthopaedic oncology compared to the-literature, an AI tool that retrieves articles from PubMed. Both AI platforms were asked to produce a literature review on seven topics in orthopaedic oncology selected based on author expertise. Topics included gender disparities in orthopaedic surgery, reconstruction after sarcoma resection, surgical management, venous thromboembolism prophylaxis, and prosthetic failure. The responses were rated by two independent reviewers on accuracy, evidence/analysis, conclusion, and quality of references. Descriptive statistics were performed. ChatGPT and the-literature had similar accuracy with an average of 4.14. The-literature had a higher average rating than ChatGPT in the analysis for a research topic, 4.14 and 3.86 respectively. The-literature produced a better conclusion in comparison to ChatGPT, 4.43 and 4.0 respectively. ChatGPT was able to generate higher impact references with an average of 4.14 in comparison to 3.43 in the-literature group. ChatGPT generated fewer references in comparison to the-literature, 9 and 11 respectively. Neither platform was able to identify all relevant articles for a specific topic. The literature review summaries produced by AI require careful human validation. Each AI was able to provide resources from higher impact orthopaedic journals and relevant journals from other specialties. The reviews could be used to inform future research.



## A Novel invention of a 3D Printed mould for calcaneum replacement post total calcanectomy for a recurrent aggressive GCT of the calcaneum.

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Advances in image processing have led to the clinical use of 3D printing technology, giving the surgeon a realistic physical model shape of the anatomy upon which they can reproduce to recreate the bone anatomy. 3D printed moulds can play a central role in surgical replacement which are efficient and economical. This case reports the novel invention of creating an anatomical calcaneum using the 3D printer. A patient with a recurrent aggressive stage of GCT of calcaneum that mandated a complete resection of the calcaneum leaving a huge void, needing reconstruction. This paper reports the 3D printing methodology from the pre operative printing of the prototype, surgically to the post operative care. The shaped bone cement calcaneum is implanted into the patient with screws and adjunct with the proline mesh anchoring to the soft tissues and archilles tendon. Post operatively, patient is kept on a slab for 6 weeks awaiting soft tissue incorporation. 6 weeks post-surgery, patient commenced weight bearing with an aesthetically shaped foot. This is an efficient, economical and reproducible method for boney reconstruction.

## Patented Multi-axial fracture reduction device.

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Anatomical fracture reduction is essential for optimal bone healing and good functional outcome. Conventional open reduction and internal fixation (ORIF) causes substantial iatrogenic periosteal stripping and soft tissue damage. Reduction devices can help achieve indirect reduction without opening the fracture site and facilitate internal fixation with minimal soft tissue dissection. Although few reduction devices are available, there is a paucity of evidence in scientific literature, and they have a limited degree of freedom to reduce the fracture in all three dimensions. We have designed and patented a multi-axial reduction device which can help to reduce the fracture in all three dimensions and has 16 degrees of freedom. The device's effectiveness is already proven in the saw bone model mimicking different fractures. The device was applied for a patent on 17-03-2016 and granted a patent with the number 500096/2024. In our in vivo prospective randomized clinical trial, we compare the conventional open reduction procedure (20 samples) with the reduction device (20 samples). With this device, one can achieve anatomical reduction with preservation of the biological milieu with the requirement of fewer assistants when compared with ORIF. There is less periosteal stripping in the device group compared to open reduction. The device is inexpensive, reproducible with a short learning curve and can be a very useful armamentarium for the Orthopaedics fraternity. It can be useful for reducing and plating of long bone fractures (metaphyseal) with minimal affection of fracture milieu.

## A new international patented variable-angle locking system

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We have developed a novel variable-angle locking system that has been successfully patented in the EU, US, and Eurasia regions and is very suitable for fracture treatments in areas such as the hand, foot, spine, and maxillofacial surgery. One of the significant advantages of this new system is its simplicity and cost-effectiveness in production. The secure attachment between the screw and the plate is facilitated by a specially designed screw head and a corresponding hole in the plate. We conducted a finite element study, and the results indicate that while stresses experienced by the screw under axial load are marginally higher in the new locking system compared to the control system, the differences are not significant. In bending tests, stresses on the screw were found to be higher with the control locking system, whereas stresses on the plate were higher with the new locking system. Cyclic tests, which involved the bending of screws secured in the plate, revealed no statistically significant differences in displacements between the new and control locking systems. Moreover, static push-out tests demonstrated that when the screw is locked perpendicular to the plate, the maximum force required to disengage the strong connection between the screw head and the screw in the plate was statistically higher with the control locking system. This indicates superior resistance to disengagement in critical scenarios. Overall, our innovative variable-angle locking system offers a promising solution for achieving secure fixation on thin plates, with benefits in various surgical applications, especially in delicate anatomical regions.

## A novel technique for treating pseudarthrosis of the long bones: PRP drilling

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**Introduction:** Nowadays 10% of fractures progress to pseudarthrosis which constitutes a major public health problem. Faced with this condition, various treatments have been developed such as decortication-grafting which require a relatively heavy procedure. Other authors have described the injection of platelet-rich plasma (PRP) intrafocally, however with significant difficulties in injecting it into a fibrosis-filled space. We describe the technique of drilling-PRP as a therapeutic alternative, combining percutaneous drilling of the focus and the addition of PRP into the cavity created.

**Materials and Methods:** This is a retrospective study conducted over two years and half involving patients treated with Drilling PRP for pseudarthrosis. This technique was indicated in cases of lack of consolidation after 9 months of initial treatment with radiological stagnation for more than 6 months.

**Results:** Our study included 10 patients. The average age was 46 years. The tibia was the most frequent location of pseudarthrosis. 60% of pseudarthrosis was atrophic and 40% were hypertrophic. The average time for Drilling PRP after initial treatment was 10 months. Consolidation was achieved in 100% of patients with an average time of 3 months.

**Discussion and conclusion:** The combination of percutaneous drilling with PRP injection is an effective, less costly and invasive technique than traditional methods for the treatment of pseudarthrosis, and to our knowledge not described in the literature. This technique is based on the advantages of bone drilling which restores blood circulation at the site of pseudarthrosis and creates an intrafocal cavity that can contain PRP which deliver a high concentration of autologous bioactive factors that participate in the process of neovascularization, tissue remodeling and regulation of inflammation with the advantages of a minimally invasive percutaneous procedure.

## App-based digital patient care in endoprosthesis – Benefits and Limitations

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The digitalization of the healthcare system is constantly advancing. However, it is not fully clarified to what extent patients are technically and cognitively ready for the new technologies. The aim of this investigation is to determine how many, and which patients of primary knee and hip arthroplasty can be digitally cared perioperatively using an app from the company Buddy Healthcare Ltd Oy (Helsinki, Finland).

From April 2022 to August 2022, patients were offered the opportunity to receive the app and use it until the 3-month check-up. The app offered information about the surgery, advice for lifestyle and physiotherapy exercises. The patient-reported outcome measures (PROMs), the joint function questionnaires and its response rate were generated. The rating of the app application (1 not useful to 5 very useful) had been determined. 66% (33 women, 20 men,  $\bar{x}$  66.6 years) of 80 patients could receive this app. The app rejectors (18 women, 9 men,  $\bar{x}$  77.4 years) did not have an app-enabled mobile phone (74%) or were not app-firm (26%). Out of the 53 app patients, 7 (13%) did not register and never used the app. As a result, only 46 (58%) of all patients surveyed have been able to receive digital care. The response rate of PROMs and joint function questionnaires was 100% preoperatively and 83% at 3-month follow-up. The average rating of app usefulness was 4.54/5.

The app is a useful tool, although a high proportion of patients could not be accompanied by it perioperatively for technical and cognitive reasons.

## Tension of Gap Resection in Robotic assisted Total Knee Arthroplasty

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Background: Robotic-assisted surgery is the new trend in total knee arthroplasty (TKA) encouraging precision, the accuracy of surgery, and less soft tissue dissection. Robotic TKA's Pre-Resection Balancing approach, bone resection was assessed by paddle thickness but the tension of the gap could not be determined. The aim of this study was to indicate the tension of gap resection in robotic total knee arthroplasty. Method and material: 73 patients underwent MAKO robotic-assisted TKA. After the medial parapatellar approach, the deep MCL was released in the varus knee, while the iliotibial band was released in the valgus knee. Paddle thickness was used to balance gaps in the extension and flexion positions. The femoral and tibial component positions were adjusted to achieve a proper gap. After proximal tibial resection, gap tension was evaluated with a tension device (B-Braun), starting from 100N in extension then increasing tension until the actual gap and planning gap were equal. We did the same technique in the flexion gap. Gap tension were collected. Robotic TKA was performed as usual. Prosthesis was installed with Cemented fixed-bearing TKA (Triathlon, Stryker). Result: The mean of soft tissue tension of the medial extension gap was  $165.83 \pm 33.81$  N and  $162.5 \pm 28.56$  in the lateral extension gap. The mean difference in the extension gap was 3.33 N ( $p=0.571$ ). The mean of soft tissue tension in the medial and lateral flexion gap was  $166.67 \pm 39.77$  N and  $190.83 \pm 39.59$  N, respectively. The mean difference in flexion gap was 24.17 N, which is a significant difference ( $p=0.001$ ).

## Virtual Reality (VR) arthroscopic simulator in shoulder arthroscopy training improves trainee efficiency (time to completion of task) with limited improvement in quantitative skills (arthroscopic evaluation scores): A Systematic Review

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**Introduction:** Shoulder arthroscopy is associated with a steep learning curve. Virtual reality (VR) arthroscopic simulator training has gained prominence as a promising training modality for shoulder arthroscopy. However, there is a lack of high-quality evidence on its efficacy. Thus, this study aims to investigate the effects of VR simulator in shoulder arthroscopy training. **Methods:** A systematic search of four databases (PubMed, EMBASE, Scopus and Cochrane Library) was performed. Studies which compared outcomes pre- and post- VR training as well as outcomes between VR groups and Control (non-VR/low fidelity) groups were included. Primary outcomes between VR and Control consisted of time to completion and validated arthroscopic evaluation score. In addition, pre- versus post- training improvement in arthroscopic evaluation score was evaluated. **Results:** Seven studies were included in this systematic review. Total cohort size was 143, with 93 in the VR group and 50 in the Control group. Studies that compared time to completion in VR and Control groups all showed a significantly shorter time to completion in the VR group. However, while several studies showed pre- to post- training improvement in arthroscopic evaluation score, comparison between the VR and Control groups did not show significant difference across the studies. **Conclusion:** This study found that VR training results in shorter task completion time for trainees, whereas there is no difference in arthroscopic evaluation scores between VR versus control groups. Hence, VR simulator training improves arthroscopic efficiency for Orthopaedic trainees, with limited improvement in quantitative skill.

## Arthroscopy-assisted ankle arthrodesis in challenging cases - Surgical approaches and outcome

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**Abstract:** Introduction: Ankle arthrodesis is a valuable treatment for end-stage ankle pathologies. Arthroscopy-assisted techniques offer a minimally invasive approach with potential benefits. This study presents outcomes of arthroscopy-assisted ankle arthrodesis in two distinct pathologies: Charcot's joint in a 64-year-old uncontrolled diabetic female and Post-traumatic arthritis in a 28-year-old male after a compound injury with a muscle flap in the anterior ankle. **Methods:** The first patient had a tri-malleolar fracture, undergoing arthroscopy-assisted cartilage resection of the ankle followed by cannulated hind-foot arthrodesis nailing in the supine position. The second patient had a large medial-based gastrocnemius muscle flap on the anterior ankle in a post-traumatic fibrous ankylosis. **Results:** Our study demonstrates the efficacy of arthroscopy-assisted ankle arthrodesis in stabilizing an unstable ankle and improving symptoms in a stiff ankle, providing a comprehensive perspective on these challenging pathologies. **Conclusion:** Arthroscopy-assisted techniques offer advantages including improved outcomes, shorter surgical times, and potential for better union, making them a valuable option in the management of complex ankle pathologies.



## Interest of arthrodesis of the ankle in the paralysis of the sciatic nerve

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**Introduction:** arthrodesis of talo crurale is still considered the reference treatment for degenerative arthropathies of the ankle . However , the risk of pseudarthrosis and infection is not negligible . It seems that a variant of this technique under arthroscopic control limits the occurrence , and improves the immediate consequence. **Methods:** This is the medical observation of a 66-year-old patient who has been complaining for 12 years of paroxysmal paresthesia with right sciatic grand nerve paralysis. The clinical examination of the musculoskeletal system allowed to objectify a steppage at walking, a knee valgus of 10 degrees and a limitation of joint amplitudes of the ankle. The radiological assessment had objectified a pronounced osteoarthritis of the ankle. **Results:** the procedure consisted of talo crural arthrodesis under arthroscopy. The 2 anterior surgical approach of the ankle, anterior internal and external, allowed us after a good exploration to make a resection of the cartilage with the shaver and which were removed by grasper clamp, osteosynthesis was made by 2 cannulated spongy screws under scopic control. **Discussion:** Arthrodesis of the ankle under arthroscopy has many advantages over open air; it does not leave any aesthetic damage and reduces the surgical timing which reduces the risk of infection and hemorrhage; and decreases the post-operative pain

As for the fusion of the articular surfaces it is reached at the same time in our two patients.

**Conclusion:** Arthrodesis of the ankle under arthroscopy offers much advantage over the traditional technique

## Evaluation of the functional outcome following endoscopic decompression of retrocalcaneal bursitis

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**Introduction:** Retrocalcaneal bursitis is an inflammation of the bursa located between the posterior surface of the calcaneum and the anterior surface of the Achilles tendon which causes incapacitating pain. The patients not responding to conservative treatment seek surgical solutions. This study was focused on assessing the clinical efficacy of endoscopic decompression in patients with retrocalcaneal bursitis who did not respond to conservative treatment. Our primary aim was to evaluate the improvement in the American Orthopaedic Foot and Ankle Society (AOFAS) score after surgery, and our secondary objectives were to evaluate the average surgical duration and incidence of postoperative complications. **Material and methods:** This single-centered prospective interventional cohort study was conducted at a tertiary care institution, on a total of 36 adult patients (18-70 years) with clinical and radiological findings suggestive of retrocalcaneal bursitis, duration of failed conservative treatment before surgery > 6 months, and refractoriness to other forms of non-operative treatment regardless of duration. **Results:** The observations and results of our study revealed that endoscopic decompression proved efficacious in patients with retrocalcaneal bursitis. The mean duration of follow-up was 6 months [6 months to 2 years]. The average pre-operative AOFAS score was  $56.42 \pm 6.8$ , which improved to  $95.67 \pm 4.85$  at the end of 6 months. The difference between preoperative and postoperative AOFAS scores at 1 week, 2 weeks, 4 weeks, 3 months, and 6 months was statistically significant ( $p=0.0001$ ). **Conclusion:** In patients with retrocalcaneal bursitis, arthroscopic decompression is a safe, effective, and simple procedure.

## Neglected Acute Achilles Tendon Rupture: Arthroscopic FHL Transfer as reliable mini-invasive treatment option - A case report

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Achilles Tendon (at) rupture is a prevalent condition affecting both athletes and non-athletes. Chronic at ruptures often result from delayed recognition or the neglect of acute injuries. chronic at ruptures lead to diminished strength, decreased plantar flexion, and exhibit limited response to conservative treatments. While various operative repair procedures exist, primary reconstruction involving end-to-end suturing of the at may prove unsuccessful, carrying a heightened risk of complications. The authors present a case of a 32-year-old male with a neglected acute high at rupture. Initial conservative treatment, utilizing a walking boot with a wedge sole, proved ineffective due to poor patient compliance. At the three-month mark post-injury, the patient continued to experience pain, claudication, and a positive thompson test. Mri examination revealed a complete at rupture with a 3 cm tendon gap. The patient underwent posterior ankle arthroscopy with a flexor hallucis longus (fhl) transfer. The technique involved fhl tenorrhaphy and direct fixation with an interference screw in the posterior tuberosity of the calcaneus. Following surgery, the patient commenced a physiatric rehabilitation protocol. At the six-week follow-up, the patient returned to work without calcaneal pain or gait claudication. Clinical examination demonstrated 4/5 strength in plantar flexion, with limited hallux flexion. a subsequent mri confirmed complete healing of the previous at rupture. Fhl transfer emerges as a reliable option for chronic at rupture in patients with no substantial functional demands who remain functionally impaired. The arthroscopic approach diminishes complications such as skin necrosis and infection, offering comparable clinical outcomes to traditional techniques.

## Footsteps to Recovery: Unveiling the Impact of Stress Calcaneal Fractures in Active Lifestyles

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Stress fractures are frequently underdiagnosed and undertreated, despite their prevalence in sports. Early diagnosis is crucial, necessitating a high index of clinical suspicion and complementary examinations for confirmation and follow-up. Here, we present the case of a 53-year-old female nurse who experienced pain in the bilateral retrocalcaneal region, exacerbated on the right side, following a 25 km walk. Magnetic resonance imaging confirmed bilateral calcaneal stress fractures. Treatment involved weight bearing as tolerated and vitamin D supplementation. After 5 weeks, she noted substantial improvement in symptoms and subsequently resumed full activity without experiencing a recurrence. Calcaneal stress fractures often result from repetitive overload and intense axial weight-bearing, exacerbated by factors such as prolonged walking. Conservative management, including activity modification without casting or surgery, proves effective. In cases of bilateral stress fractures, metabolic and nutritional factors warrant careful consideration. This case highlights that stress fractures can occur not only in high-performance athletes but also in individuals who engage in extensive walking as part of a healthy lifestyle. Early diagnosis and appropriate treatment are crucial for achieving complete recovery and enabling a safe return to daily activities.

## Talar Reframing Osteotomy; A Surgical Salvage Technique For The Talus Osteochondral Allograft Transfer Mismatch

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**Introduction:** Osteochondral lesions of the talus cause pain, functional limitations, and disability of the ankle. Fresh osteochondral allograft (OCA) has been used as a biological salvage treatment option for talus. In this case report, we aim to describe the surgical salvage technique for the talus OCA transfer mismatch. **Case presentation:** 39 years old male patient with a 3.5 cm<sup>2</sup> talar osteochondral defect applied to our clinic. Radiographs were used for surgical planning and articular side measurements were performed. Using anterior approach, centered over tibiotalar joint, the damaged articular surface of the talus was resected about 10-mm depth. The talar graft couldn't directly be placed to the resection site because the posterior border of the graft was obstructed by the fibular surface due to patient's anatomy. To solve this problem, we performed a longitudinal osteotomy on the lateral side of the talus and a 2 mm part was extracted. Osteotomized part and the main talar graft body were fixed with two screws. Graft placement was confirmed via fluoroscopy and was later fixated. The ankle joint was brought through a range of motion to check graft stability and position. **Outcomes:** Postoperatively, graft incorporation was confirmed radiographically at 12 weeks. After 24 months, at final follow-up, patient's AOFAS Ankle/Hindfoot Scale was improved, from 70 to 88 and the VAS was altered from 6 to 3, postoperatively. **Discussion:** Ankle joint anatomy graft mismatch is challenging problem and in this report we describe our reframing osteotomy technique to obtain a matching graft.

## Case Report: Arthroscopic treatment of an anterior process fracture of the calcaneus in a Ballet Dancer

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**Introduction:** Fractures of the anterior process of the calcaneus are often undiagnosed. These fractures are commonly described in young athletes, resulting from mechanisms of microtrauma (torsion or avulsion). Conservative treatment is indicated in the majority of cases, with surgical intervention indicated in acute fractures of the anterior process with displacement or involvement of the calcaneocuboid joint.

**Case Report:** We describe the case of a 34-year-old dancer who presented to the clinic with persistent pain on the lateral aspect of the ankle and foot affecting daily activities. She reported a history of left foot sprain 5 months before.

Diagnostic imaging revealed a fracture of the anterior process of the calcaneus with involvement of the calcaneocuboid joint (Degan Classification - III). An arthroscopic approach under fluoroscopic control was performed with excision of the fragment. During follow-up, complete recovery was observed with a return to her activity as a dancer, without functional impairment or painful complaints.

**Discussion:** Dislocated acute fractures involving the calcaneocuboid joint may benefit from reduction and fixation to restore anatomy and reduce the risk of symptomatic post-traumatic arthritis. The role of arthroscopy continues to evolve as a minimally invasive technique with minimal disruption of soft tissues, allowing direct visualization of the articular surface.

**Conclusion:** Fractures of the anterior process of the calcaneus are common injuries in athletes. Surgical treatment is often indicated, and currently, the arthroscopic approach plays an important role. Outcomes tend to be favorable, with a return to regular activity without limitations.

## Posterior Tibial Tendon Deficiency- Epidemiological Case Series from a non super speciality tertiary care hospital identifying plausible risk factors in the adolescent population.

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Background: Tibialis posterior dysfunction is incriminated as the most common cause of acquired adult flat foot disease. Common causes of dysfunction include hypovascularity, diabetes mellitus, and rheumatoid arthritis. Objective: To assess the different stages of presentation, epidemiological factors, risk factors, and imaging findings of PTTD. Design & Methods: 10 patients of PTTD were assessed clinically and Radiologically with X-rays and MRI. Patients were assessed by muscle charting at regular intervals recording response to physiotherapy and orthotics, and soft tissue and bony changes as seen on X-ray and MRI. Results: Of the 10 patients – 2 were in Stage I, 5 were in Stage II, 3 patients were in Stage III – with rigid deformity. Of the 3 patients with rigid deformity- 2 had paediatric onset flatfoot while the other had adolescent onset flatfoot. All 3 had diffuse weakness of core and lower limb muscles along with a common complaint of repeated falls while in single leg stance and a history of consumption of antipsychotics/ anti-epileptic drugs. Discussion: Apart from the classical patients of PTTD, we found 3 patients with paediatric and adolescent onset flat foot, with core muscle weakness, history of antipsychotic / anti-epileptic use, history of repeated falls at every attempt on single heel stance and late presentation (stage III). Conclusion: Hence, persistent non responsive flatfoot should raise suspicion of more severe pathology especially in children with antipsychotics/ anti-epileptic drug history.

## Mono-arthritis of the ankle revealing an intra-articular osteoid osteoma

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**Introduction:** Osteoid osteoma is a rare cause of bone pain. Its juxta-articular localization at the level of the back foot is even rarer and its diagnosis is often unknown. We report an observation and discuss the clinical and therapeutic aspects of this localization. **Observation :** We report the observation of a patient fasting 32 years with an osteoid osteoma intra-articular of the joint under-talian. In front of an atypical clinical picture made of a chronic arthritis under talian rebel with anti-inflammatory non-steroidal and analgesics, The diagnosis was made only 2 years after the first consultation using cross-sectional imaging. Indeed, the osteoid osteoma image of the calcaneum associated with synovitis and joint effusion, suspected on the MRI, was confirmed by CT scan which highlighted the nidus image. The surgical removal of the tumor allowed the total disappearance of pain in immediate postoperative as well as the recovery of joint function. **Discussion:** If the diagnosis of O. O is easy in the classical diaphyseal locations, an associated reactive synovitis in the juxta-articular forms is responsible for an atypical clinical presentation causing a diagnostic delay. CT scan remains the reference exam to confirm diagnosis. **conclusion.** Block excision of the tumour relieves pain and restores joint function



## A recurrent Desmoid tumor of the foot.

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**Introduction:** Desmoid tumor is a pseudo tumor and benign fibroblastic formation but are characterized by a real local malignancy because of its propensity to recurrence. **Methods :** A 23-year-old patient who had nine surgical procedures for thigh and right leg tumours has recurrence with extension of the tumour to the thigh root, the popliteal cavity and the sole of the foot **Discussion :** The therapeutic strategy of recurrent desmoides tumours remains poorly defined. Carcinological excision faces great technical difficulties due to the absence of any cleavage plane and tight adhesions to neighboring structures. Radiotherapy and hormonal therapy can only be complementary when the tumor resection is partial with a risk of sarcomatous degeneration reported. The certainty of definitive cure of these tumors has slow and local evolution is always difficult to affirm . **Conclusion:** Desmoid tumor remains rare. Recurrences are frequent leading to iterative surgery increasingly difficult and mutilating .Adjuvant treatment remains recommended when the excision is incomplete especially in case of infiltration of the vasculo-nervous axes

## neurological flat foot in children

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Introduction: Neurological flatfoot is a complex and variable three-dimensional deformity, leading to valgus of the hindfoot, loss of the medial longitudinal arch and an abducted and supinated forefoot.

Materials & methods: this is a retrospective study in the pediatric trauma and orthopaedics department of the University Hospital Center Marrakech over 12 years. It is about 17 children and 28 feet. Results: The sex ratio was 1.125, and the mean age was 9 years [3-16 years]. The most common pathology was cerebral palsy (59%). The deformity (100%) and walking fatigue (35%) were the principal symptoms leading to consultation. The deformity was reducible in 25 feet (89%). The preoperative AOFAS score ranged [50 – 75], with an average of 60,32. Angles measured on standard radiographs of the foot: the talocalcaneal divergence angle and the Dijan-Annonier angle.

Orthopaedic Treatment including motor physiotherapy and/or insoles for 10 feet (36%). Surgically, 25 feet (89%) operated using Grice arthrodesis technic and 3 feet (11%) using Evans calcaneal lengthening osteotomy technic. Two cases of complications were noted. The postoperative AOFAS score [ 40– 100], with an average of 76. The mean follow-up was 20 months. Overall results were favourable for 15 feet (53%), average for 12 feet (43%) and unfavourable for 1 foot (4%). Conclusion: Early management of neurological flatfoot remains the best guarantee of a good outcome. Grice arthrodesis technic seems giving good results for flexible flatfoot before age of 8 years. We also found that the Evans osteotomy is more adapted after 8 years of age.

## The interest of WEIL osteotomy in the treatment of FREIBERG disease

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**Introduction:** Freiberg's disease is a rare osteonecrosis of metatarsal heads whose etiopathogenesis is still poorly known. The treatment still not codified hence the interest of our work which shows the place of the osteotomy of WEIL in the treatment of this pathology. **Methods:** The average age was 24 years with symptomatology predominated by forefoot pain associated with joint stiffness. The time of diagnosis was 11 months with an involvement of the 3rd metatarsal in 3 cases. The SMILIE classification was used to stage the pathology finding 3 patients stage 3 and 1 patient stage 4. All patients benefited from a horizontal osteotomy of WEIL associated with a fixation by a mini screw. The mean follow-up was 24 months with a Kitaoka score of 85 points, pain disappeared in all patients and shoeing was also possible in all patients with a plantar flexion limitation in 1 patient. **Discussion:** Freiberg's disease often affects the head of the 2nd and 3rd metatarsals in women of the 2nd decad following sports microtraumas giving elective pain to the dorsal pressure of the head of the metatarsal. The treatment is often surgical according to several techniques including osteotomy of WEIL. This technique is favoured by several authors because of its simplicity and preservation of the length of the metatarsal. **Conclusion:** Freiberg's disease remains a rare and poorly known pathology diagnosed according to clinical and radiological criteria. The latter is easy, reproducible and allows early mobilization.

## Painful Accessory Ossicle – a case of Os Peroneum Syndrome

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### Background

Os peroneum is an accessory ossicle of the foot, located within the peroneus longus tendon, and is one of causes of pain in the lateral aspect of the midfoot, causing the Painful Os Peroneum Syndrome. A clinical history of lateral pain in addition to a positive physical examination should raise this suspicion. Magnetic resonance imaging (MRI), plays an important role in the diagnosis.

### Case Presentation

A 52 years old man, with no relevant medical background, presents with progressive atraumatic pain in the lateral aspect of the right foot. MRI revealed a longus peroneus tendinosis. The patient was treated with growth factors infiltrations, followed by a tenoscopy with a synovectomy. In 2021, the patient returns. The MRI demonstrated a large os peroneum and a tendinosis of the peroneus longus tendon. After the conservative treatment failed, an open surgical excision of the os peroneum was performed.

### Clinical Outcomes

The surgical excision of the 20mm os peroneum took place with no intra-operative complications. During the follow-up, no post-operative complications were described. The limb was immobilized for 2 weeks. At that time, the patient presented with a complete painless range of movement. No pain recurrence was described.

### Discussion

The os peroneum is an accessory ossicle, with a round or oval shape, within the substance of the peroneal longus tendon, and may potentially lead to an Os Peroneum Pain syndrome. Surgical treatment is debatable. Nowadays, some authors defend an early invasive approach in some patients – young individuals, athletes or significant pain or limitation

## How can Footwear And Insole Design help Prevent Diabetic And Neuropathic Plantar Forefoot Ulcers; - Findings From A Series Of N-Of-1 Trials

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### Background

Foot complications occur in conjunction with poorly controlled diabetes. Footwear and insoles are used to offload the neuropathic foot, success of offloading is dependent on patient adherence. This study aimed to determine which design and modification to footwear improve forefoot plantar offloading patient compliance.

### Methods

This study, involving a series of N-of-1 trials, included 12 participants who had a history of neuropathic plantar forefoot ulcers. This trial was non-randomised and unblinded. Participants were recruited from three sites, including two high-risk foot services and a private podiatry clinic in Sydney, Australia. plantar pressure mapping systems were used to measure barefoot and in-shoe plantar pressures. Participants' self-reports were used to quantify the wearing period over a certain period of between two to four weeks during the trial. Participant preference toward footwear, insole design and quality-of-life related information were collected and analysed.

### Results

All types of footwear and insole modifications helped to reduce peak plantar pressure but the sole modifications (rocker apex position and rocker angle, medial or lateral wedges, heel height adjustments and sole rigidity) were more effective in plantar pressure reduction. The adherence score percentage was high (over 80% for the majority of cases, n=7, over 70% for n=4 and above 60%, n=1) for their intended use and activity, Participants' satisfaction level increased towards the end of the trials. (90-100%, n=8, 70-80%, n=3, 40-50%, n=1).

This was the first trial assessing footwear and insole interventions in people with diabetes by using a series of N-of-1 trials.

## Review of Treatment of PCFD

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Progressive collapsing foot deformity, also known as adult acquired flatfoot deformity, is a complex condition that typically involves a combination of soft tissue and bony changes in the foot. Treatment may vary depending on the severity of the deformity and can include both non-surgical and surgical options.

Non-surgical treatment options may include:

1. Rest and activity modification: Avoiding activities that exacerbate the pain and inflammation in the foot.
2. Orthotic devices: Custom orthotics can provide support to the arch and help redistribute pressure on the foot.
3. Physical therapy: Specific exercises can help strengthen the muscles that support the arch of the foot and improve range of motion.
4. Bracing: Ankle-foot orthoses (AFOs) or other bracing options may help support the foot and ankle.

If non-surgical treatments do not provide relief or if the deformity progresses, surgical intervention may be recommended. Surgical options may include:

1. Tendon repair: Rebuilding or repairing the damaged tendons that support the arch of the foot.
2. Osteotomy: Surgically correcting the alignment of the bones in the foot to restore the arch.
3. Fusion: Fusing joints in the foot to stabilize and correct the deformity.

It's important to consult with a healthcare provider, such as a podiatrist or orthopedic surgeon, to determine the most appropriate treatment plan for your specific condition. They can evaluate the severity of the deformity and recommend the best course of action to help alleviate pain and improve function in your foot

## A rare case of bilateral non-traumatic subtalar lateral dislocation

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**Introduction:** Subtalar dislocation typically results from trauma and involves both the talonavicular and talocalcaneal joints, constituting less than 1% of all traumatic dislocations. The etiology of bilateral non-traumatic subtalar dislocation is often associated with posterior tibialis tendon dysfunction, which commonly leads to peritalar subluxation and very rarely dislocation.

**Case presentation:** A 57-year-old female, who experienced a mild ankle sprain 30 years ago, presented with ankle and foot pain for 5 years, along with difficulty walking, managed with custom-made shoes and insoles. Clinical examination revealed bilateral flat foot deformity, severe adduction of both feet, with the heels displaced laterally when standing. Additionally, the talar head was dislocated and prominently palpable medially but reducible. Preoperative imaging confirmed lateral displacement of the calcaneus with simultaneous dislocation of the talonavicular and talocalcaneal joints. Surgical intervention involved subtalar arthrodesis, talonavicular and calcaneotalar joints fusion using cannulated screws, along with tarsal tunnel spongioplasty initially performed on the right foot and subsequently on the left foot after 6 months. The postoperative protocol included 6 weeks of casting, followed by 8 weeks of non-weight-bearing, and then gradual weight-bearing with the aid of an ankle brace and physical therapy.

**Discussion:** There are only a few published cases documenting lateral peritalar chronic dislocation attributed to posterior tibial tendon deficiency. A limitation of this case is the persistence of flatfoot deformity, despite the patient being completely satisfied with the surgical outcome. Consideration of calcaneal osteotomy for flatfoot correction may be warranted as an additional treatment option.

**Keywords:** peritalar dislocation, subtalar arthrodesis.

## Mueller-weiss disease: a case report and literature review

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Mueller-Weiss disease is a rare multifactorial idiopathic foot disorder due to osteonecrosis of the tarsal navicular bone. It is often seen in female adults with fragmentation of the tarsal scaphoid, perinavicular arthritis, and in the long term with progressive collapse of the medial longitudinal arch of the foot. Disabling pain is the main complaint in the early stages before the onset of deformities and gait disorders. Diagnosis is made simple by weightbearing plain radiographs of the foot. The indication for surgery remains the failure of conservative nonoperative treatment and depends more on severity of symptoms rather than radiological staging. The choice of the appropriate surgical technique calls for a wide range of options. It depends on the presence of bone loss and associated midfoot and hindfoot arthritis. Different types of arthrodesis are the most common with the better functional outcomes according to the literature. The most used are talonavicular or talonavicular-cuneiform arthrodesis with or without bone grafting. In this work, we report a clinical case of this condition of rather early manifestation during the evolutionary course of the disease. The clinical and radiological presentation as well as the therapeutic approach were detailed. The short- and medium-term follow-up was recorded. Through this case and a large review of published papers, the etio-pathogenesis, clinical, radiological, therapeutic and evolutionary features of this disorder are documented. It is highlighted that the disease remains misdiagnosed. An early diagnosis is the only guarantee of an effective treatment in order to avoid irreversible sequelae.



## Symptomatic Freiberg's Disease, Extraarticular Dorsal Closing-Wedge Osteotomy in 10 Patients with favorable outcomes.

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Freiberg's disease, also known as osteochondrosis or infraction of the metatarsal head, represents a common etiology for metatarsalgia. This ailment typically affects the second metatarsal head. The primary objective of our study is to systematically investigate and present the efficacy of dorsal flexion osteotomy as a therapeutic intervention for Freiberg's disease, with a specific focus on elucidating the favorable functional outcomes observed.

A retrospective analysis was conducted to assess the outcomes following dorsiflexion osteotomy in 10 patients. Patient contentment, clinical observations, and radiographic measurements were meticulously examined, with an average follow-up period of 24.7 months. Dorsiflexion osteotomy was carried out on 8 women and two men who were experiencing symptomatic Freiberg's disease and had not responded to conservative treatments. Their average age was 29 years, ranging from 14 to 55. The disease's progression was classified using Smillie's classification. The procedure yielded outstanding results for all patients, demonstrating minimal reduction in metatarsophalangeal mobility and an average reduction of 2.3 mm in metatarsal length based on X-ray assessments. Moreover, postoperative metatarsalgia was absent. Complete pain relief was achieved. Dorsiflexion osteotomy stands as a viable and non-destructive treatment choice for addressing symptomatic Freiberg's disease. Its distinctive ability to restore joint congruity throughout various disease stages contributes to a significant number of favorable outcomes.

## Intraosseous lipoma of the calcaneus (About 08 cases)

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**Introduction:**Intraosseous lipomas are rare benign tumors, representing 0.1% of skeletal tumors,localization in the calcaneus15% of cases,female predominance.It touches the subject of the fourth or fifth decade.The clinic is devoid of any specificity, namely mechanical pain in the rear foot.Imaging, particularly MRI,allows the diagnosis to be made.Treatment remains divided between abstention and surgery.**Material:**We report a series of 08 patients with an average age: 33 years:5 male+3 females.The clinic had talalgia for3 patients, accidental discovery:5 patients.Standard radiography was done for all patients Surgical treatment for7 patients, and1 patient:abstention.Histology confirmed the diagnosis for all operated patients.The surgical intervention consisted of external approach,obviously to the tumor and filling with cancellous bone was necessary given the importance of the bone gap.**Results;**The clinical symptoms disappeared in7 patients, one patient benefited from corticosteroid infiltration because she had plantar fasciitis.The follow-up is 36 months with favorable evolution for all cases.**Discussion:**Intraosseous lipomas are generally asymptomatic, discovered incidentally during a radiological examination in 40% of cases. Imaging and particularly MRI makes it possible to make the diagnosis.Typically the lipoma presents itself as a lacunar image well limited by a border of osteosclerosis and in more than half it is finds calcification and sometimes bony trabeculae giving a septate appearance, whose calcaneal locations,quasi-pathognomonic semiological characteristics are sufficient for the diagnosis.The etiology is unknown and at present, most authors believe that intraosseous lipoma is a primary tumor of bone marrow fat.**Conclusion;**Rare pathology, knowledge of certain pathognomonic radiological signs in the calcaneal location with the contribution of CT and MRI gives the diagnosis

## Evaluation of Patient Satisfaction Using Decision Regret Scale After Surgery to the Small Joints With Rheumatoid Arthritis

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### Introduction:

The clinical significance of patient reported outcomes have been widely used, some patients show the mismatch between their results and actual satisfaction. To analyze this mismatch, we focused on the Decision Regret Scale (DRS) from another point of view of the evaluation. DRS is a validated measurement to assess decisional regret after medical intervention. Besides, using the term "Regret" would help us understand what affects prevalence of dissatisfaction. The objectives of this study were to evaluate patient satisfaction using DRS as well as identify factors associated with postoperative "Regret" after small joint surgery with rheumatoid arthritis (RA).

### Methods:

114 primary RA surgeries (32 wrists/fingers; Group I, 82 feet; Group II) with at least 1 year follow up were included. Each group answered to DRS and Visual Analog scale (VAS) which were used to assess patient satisfaction. Function, appearance, and total satisfaction were evaluated using VAS. DRS consists of 5 questions, and higher DRS scores indicate higher levels of regret. The correlation between VAS and DRS was analyzed. The study protocol was approved by ethics committee and the written informed consent was obtained.

### Results:

The mean values of VAS and DRS showed no difference between groups.

Although in Group II, a significant inverse correlation was observed between DRS and all the examined factors, in Group I, DRS had a significant inverse correlation with functional satisfaction and total satisfaction, but there was no correlation with appearance satisfaction.

## Functional outcome of FHL transfer for treatment of chronic tendo Achilles (CAT) tear using single incision.

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Introduction: Chronic Tendo Achilles Tears are common and surgically challenging problems. Flexor Hallucis longus transfer is used to improve pain and functional outcomes. The aim of our study is to study clinical outcome of foot and ankle post-surgery. We also aim to study the effect of FHL transfer using AOFAS Hallux scores. Materials and Methods: 24 cases were enrolled who had irreparable gap of tendon Achilles on MRI. 4 were lost in follow-up. 20 cases were studied. These cases had a gap between 2 cut ends of Tendo Achilles, as seen intraoperatively. The FHL was harvested by cutting distal end through the same incision. FHL cut end was sutured with whip stitch and tenodesed with a suture anchor in calcaneus at 40 degrees plantar flexion. Below Knee cast is applied. Patient was followed up at 3rd, 6th, 10th weeks. Later followed up every month. Results: The average age of patients were 56.35 years (45-68). 6 patients had diabetes as medical comorbidity and 50% of patients had tobacco addiction. The FAOS score improved from an average score of 58.05 preoperatively (Range 38-72) to average score of 88 postoperatively (Range 77-98). Wilcoxon Signed rank test was used which suggested the results are statistically significant. The effect of FHL transfer was gauged by AOFAS Hallux score postoperatively with mean score of 85.35 (Range 76-95). Conclusion: FHL transfer is an effective and safe method of surgical option in chronic Tendo-Achilles tears, with minimal adverse effect on donor site based on AOFAS Hallux scores.

## Ankle Fusion Using the Ilizarov Method

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**Introduction:** Ankle fusion is a common surgical procedure for end-stage ankle arthritis, failed arthroplasty, or severe deformities. The Ilizarov method offers a unique approach to ankle fusion, providing stable fixation, deformity correction, and the potential for bony union. This systematic review aims to evaluate the efficacy, safety, and outcomes of ankle fusion using the Ilizarov method through a comprehensive analysis of the existing literature. **Materials & Methods:** From 1990 to 2023, 205 patients were treated (122 males, 83 females) with Ilizarov apparatus in Ankle fusion. The mean age of patients was 36 (range 10-65 yrs.). Patient charts and radiographs at three different time points (preoperative, postoperative, fixator removal, and final follow-up) were reviewed. Data on patient demographics, surgical techniques, outcomes, and complications were extracted and analyzed. Meta-analysis was performed where applicable to assess fusion rates and functional outcomes. **Results:** The Ilizarov method demonstrated favorable fusion rates ranging from 80% to 100%, with mean time to fusion ranging from 3 to 6 months. **Conclusion:** Ankle fusion using the Ilizarov method is a viable option for patients with end-stage ankle arthritis or deformities. The technique offers stable fixation, deformity correction, and high fusion rates, with satisfactory functional outcomes reported in the literature. While complications may occur, careful patient selection, meticulous surgical technique, and postoperative management can minimize adverse events and optimize outcomes. **Keywords:** Ankle fusion, Ilizarov method, external fixation, ankle arthritis, deformity correction, systematic review, meta-analysis.

## Extended Curettage and Denosumab Therapy in the Management of Giant Cell Tumor of the First Metatarsal: A Case Report"

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Giant cell tumor (GCT) of bone presents unique challenges in terms of management, particularly when located in uncommon sites such as the first metatarsal. We present the case of a 27-year-old male with a 9-month history of swelling over his left foot, ultimately diagnosed with GCT of the first metatarsal. Initial treatment with curettage was followed by recurrence, prompting extended re-curettage with meticulous preservation of the periosteum scaffold. This was supplemented with sturt fibula grafting and cancellous bone grafting to restore metatarsal integrity. Concurrently, the patient received 2 months of preoperative denosumab therapy followed by 24 months of postoperative denosumab therapy, which effectively prevented local recurrence. Follow-up imaging and clinical assessment demonstrated successful lesion healing and functional recovery. This case highlights the importance of a multimodal approach, including surgical intervention and targeted medical therapy, in achieving favorable outcomes in challenging presentations of GCT.

## Corrective osteotomy of the fibula for malunion of the bimalleolar fracture of the ankle

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Ankle fractures are common injuries and they can lead to posttraumatic ankle arthritis which is the leading cause of ankle arthritis, especially in young people. Anatomic reduction of the lateral malleolus is the key of anatomic reduction of the ankle joint. The goal of the corrective osteotomy of the fibula for malunion ankle fracture is to restore the natural shape of the joint so the joint can fulfil its function optimally. We present 40 year-old male with malunion of the bimalleolar ankle fracture, AO/OTA 44B2.2 type due to previously insufficient fixation.

Ankle fractures involving the lateral malleolus left unreduced or bad reduced as in this case, lead to malunion and posttraumatic arthritis. The patient had limited movements of the ankle joint, swelling and pain. We did the X-ray and CT-scan and we decided for a corrective osteotomy of the fibula and restore the ankle joint and we improved the movements of the joint and the lifestyle of the patient.

## Treatment of complex tarsal navicular fractures with locking plates – Report of 2 clinical cases

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**Introduction:** Tarsal navicular bone is an essential component of Chopart joint, keystone of medial longitudinal arch, hindfoot motion and gait. Although rare, considering complex anatomy and blood supply, injuries may have devastating consequences, namely avascular necrosis (AVN) with secondary collapse, non-union, pain, stiffness, posttraumatic arthritis and hindfoot deformity. Most traumatic navicular injuries result from high-energy vehicle accidents, falls and blunt injuries, causing variable fracture patterns, often with ipsilateral foot injuries. Displaced body fractures management is through open reduction and internal fixation (ORIF), achieving anatomic reduction, medial column length restoration and rigid fixation. **Materials and methods:** A 15-years-old male, horse trampled, presented with pain, marked dorsal swelling, limited range of motion (ROM) and left foot weightbearing incapability. A comminuted navicular and nondisplaced cuboid fracture were diagnosed. A 35-years-old male, clinically similar, sustained Lisfranc fracture-dislocation type B2, comminuted navicular fracture, medial column disruption, cuboidal and median cuneiform fractures on right foot during Crosstraining. ORIF with dorsomedial locking plate through dorsomedial approach was performed, plus screws/K wires fixation for remaining fractures. They underwent 6 weeks of non-weightbearing and cast, progressing in ROM and weightbearing through following 6 weeks. **Results:** 3 months later full weightbearing was tolerated with complete ROM. After 6 months results were satisfactory: healed fractures without AVN, complete painless ROM and functional status restoration (AOFAS 97/93). **Conclusion:** treatment remains challenging, since successful intervention depends on careful exposure, minimizing devascularization risks, but enough for anatomic reduction and rigid fixation, being possible to obtain excellent results in complex navicular fractures using locking plates.



## Mosaicplasty for the treatment of a 3-year-old osteochondral lesion of the talar dome - Report of a clinical case

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**Introduction:** Osteochondral lesion of the talus (OLT) is a common condition associated with inversion ankle injuries, challenging diagnosis and treatment due to cartilage healing and constrained joint access. History and physical examination are non-specific and non-diagnostic, including weight-bearing/activity related pain, swelling, stiffness and mechanical symptoms. Although standard OLT treatment remains controversial, osteochondral autograft transplantation -mosaicplasty - using cylindrical grafts mainly harvested from ipsilateral knee, is the only treatment using intact bone and hyaline cartilage, aiming to reproduce mechanical, structural and biochemical original properties, therefore more likely to expect better long-term results. **Methods:** 35-years-old male, presented 2 months after minor right ankle sprain and 3years after attempted conservative OLT treatment, with local pain, swelling, tenderness and limited range of motion (ROM), worsened with weight-bearing/activity. Imaging follow-up revealed posteromedial OLT (20x12mm). Autogenous osteochondral graft transplantation from ipsilateral knee (2 cylinders) was performed through medial malleolar osteotomy. He underwent 6 weeks of non-weightbearing and cast, progressing in ROM and weightbearing through following 6 weeks. **Results:** After 6 months postoperatively and proper rehabilitation program, complete ankle/knee ROM and resumption of previous functional status was observed (AOFAS score 93). Imagiological follow-up showed graft integration and healed osteotomy. No complications including wound infection, stiffness or osteochondral cylinder loosening were found. **Conclusion:** Autogenous osteochondral transplantation using knee osteochondral grafts is a very promising procedure to treat OTL, showing satisfactory short to midterm results. Although many reasonable techniques have been described, mosaicplasty is a suitable method for posttraumatic OLT, acknowledging donor site morbidity in a before healthy knee.

## Necessity of fixation of fibula in closed distal third tibia fractures: A prospective interventional study of 78 patients in a tertiary care hospital.

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Distal tibia fractures and concomitant fibula fractures associated with soft tissue injury present as common orthopaedic problems. This study evaluates the need to fix fibula fractures associated with closed distal third tibia fractures. An interventional observational study was undertaken in a tertiary care hospital in sample of 78 patients which were divided into 2 groups of 39 patients each- one in which fibula was fixed(A)- with nail(A1); with plate (A2) and one in which Fibula was not fixed(B). Cases were followed up for a mean period of six months post-operatively. The comparison of AOFAS score among both groups showed that combined Group A (A1+A2) had 32 (82.05%) excellent to good outcomes as compared to 13 in Group B (13.33%), showing a statistically significant difference ( $p < 0.05$ ). Johner and Wruh scores showed 30 (76.92%) in group A with an excellent to good outcome as compared to 15 (38.46%) group B which was significant ( $p < 0.05$ ). The mean duration of bone union in Group A1 was  $21.26 \pm 1.43$  weeks, A2 was  $21.08 \pm 1.38$  weeks and in group B was  $25.60 \pm 2.47$  weeks which was statistically significant. Fixation of fibula proved to facilitate ease of reduction of tibia and better rotational & angular stability with a superior ankle range of motion. The method of fixation of fibula did not seem to impact the outcome as long as the alignment, length, rotation was not compromised. Wound complications are not uncommon with precarious skin around the ankle and should be managed appropriately.

## An unusual case : dorsal dislocation of the intermediate cuneiform associated with a lateral cuneiform fracture

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Introduction:

The intermediate cuneiform, positioned between the medial and lateral cuneiform bones, takes on a wedge shape and is firmly connected to the first metatarsal through robust ligaments. It is recessed at the second metatarsal base and forms the “keystone” of the Lisfranc tarsometatarsal joint complex. An isolated dislocation of the cuneiform is an exceedingly uncommon injury. Dislocation of intermediate cuneiform with non-displaced lateral cuneiform fracture is so rare.

Case:

A 35-year-old man, presented to the emergency department, after a closed trauma to the left foot resulting from a sport accident, involving a mechanism of plantar hyperflexion. The initial clinical examination of his foot revealed swelling and tenderness on dorsomedial aspect of the left foot. An initial plain radiograph showed dorsal dislocation of the intermediate cuneiform bone and a nondisplaced fracture of the lateral cuneiform.

Closed reduction was performed through external maneuvers and fixation of the second cuneiform was achieved using two Kirschner wires

Results :

At 3 months follow-up, radiographs revealed consolidation of the lateral cuneiform without displacement of the intermediate cuneiform. At 12 months post-surgery, the patient had a pain-free foot with normal walking and joint ranges of motion

Discussion:

Closed reduction has little chance in these injuries. Although the failure rates of closed reduction are high, it should be attempted before open procedures. In this case, closed reduction was successful.

## The risk factors associated with the avulsion fracture of anterior inferior tibiofibular ligament (AITFL) in ankle fractures.

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Avulsion fractures of the anterior inferior tibiofibular ligament (AITFL) combined with ankle fracture were reported but the risk factors have not been elucidated. This study aims to determine the incidence of AITFL avulsions in ankle fractures based on CT evaluation and to identify its related risk factors. We enrolled a total of 156 patients with surgically treated ankle fractures and extracted information from medical records, and preoperative ankle radiographs and CT scans, on patients' demographics, BMI, medical history, ASA grade, trauma mechanism and the classifications of ankle fractures and AITFL injuries. Ankle fractures were classified on X-ray images, and AITFL fractures were identified and classified based on CT images for more diagnosing accuracy. Patients were divided into two groups: (a) with, and (b) without AITFL avulsion fractures. The risk factors for AITFL avulsions in ankle fractures were determined using Logistic regression. Of the 156 cases, 77 (49.4%) anterior malleolar injuries were identified from CT images. Among these cases, there were 49 cases (63.6%), 18 (23.4%) and 10 (13.0%) classified as type 2, 3, and 4 lesions according to the modified Wagstaffe classification, respectively. Age (OR =1.04,  $p < 0.001$ ) and posterior Pilon fracture (OR =3.52,  $p = 0.002$ ) were risk factors of AITFL avulsion fractures. AITFL injuries appeared more commonly in ankle fractures than previously thought. The elders with potential osteoporosis and the cases of posterior Pilon fractures have high incidence of AITFL avulsion in ankle fractures. Our findings provide clinicians with insights on such injuries for better surgical management.

## Management of neglected inter-phalangeal dislocation of hallux

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**Introduction:** InterPhalangeal dislocation of the hallux is defined by a total and permanent loss of contact of the phalanges of the big toe. It requires urgent treatment with reduction and immobilization. Dislocation becomes neglected after 21 days. **Methods:** This is a 22-year-old patient who presented to the consultation for hallux deformity following a 6-month trauma. **Results:** Clinical examination of the patient noted a deformation of the right hallux in irreducible dorsal sinus angulation, pain on palpation. Without vasculo-nervous disorders downstream. The patient benefited from a standard radiograph of the forefoot, objectifying a dorsal dislocation of the right hallux phalangeal. In the operating room, after spinal anesthesia, initially externally, reclining the extensor tendon hallux. A curettage of fibrosis with interline debridement, a reduction with arthrodesis by two cross pins under control by x-ray amplifier. **Discussion:** Inter phalangeal dislocations of the toes are frequent, their diagnosis is clinico-radiological. They must be treated urgently, by reduction and immobilization for 6 weeks (ligament healing time). Neglected interphalangeal dislocation is diagnosed after 21 days, its management differs and becomes heavier. An X-ray well done with orthogonal incidences is necessary, so as not to miss the diagnosis. **Conclusion:** Inter-phalangeal dislocations of the big toe are common, most often caused by direct trauma to the foot, requires urgent management.

## Evaluation of surgically treated calcaneum fractures (about 32cases)

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Introduction: Fractures of the calcaneus represent 1 to 2% of all fractures They can be either extra-thalamic or thalamic type that are more serious and more complex. Methods : This is a retrospective study of 32 cases involving patients with surgically treated calcaneal fracture, spread over a period of 4 years ( from January 2018 until September 2022). Results : 53% of patients received surgical treatment by screw plate and 47% by screwing , a corticospongy bone graft was performed in 2 patients. The post-operative Bohler angle was 26.21 , the average recoil of the Bohler angle is found to be at 20.5°.The average loss was 5.71°. The average follow-up was 2 years, 18.75% of patients developed osteoarthritis under talian and 15.6% had cutaneous necrosis. We used the KITAOKA score for the functional evaluation of patients, whose average was 66.12 with predominance of an average result in 50% of cases, good result in 40%, and poor result in 10% of cases. Discussion: The influence of a good reduction with a restitution of the thalamic surface in the functional results. The use of locked anatomical plates in the surgical treatment of thalamic fractures of the calcaneus, provide better biomechanical stability to the assembly, allowing to reduce the use of bone grafts, and allows earlier rehabilitation. Conclusion : Displaced joint fractures of the calcaneum, as is the rule for all other joint fractures, should be subject to anatomical reduction, stable fixation and early rehabilitation.

## The interest of the anatomical plate locked tibial pilon vs external fixative

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**Introduction:** Complex tibial pilon fractures remain a topical issue. Their treatment must take into account the bone side, which requires stabilization with a reconstruction of the joint surfaces in order to avoid arthrosis. **Methods:** Retrospective study of 16 cases of fractures of the tibial pilon complex from 2019 to 2021, classified type II and IV according to VIVES. Phlyctene-type skin lesions were present in 5 patients with 2 cases of type II skin opening according to CAUCHOIX AND DUPARC. The average pick-up time was 2 days. 10 cases benefited from an internal osteosynthesis by locked anatomical plate and 6 cases of an external fixation of the tibia associated with a primary osteosynthesis of the fibula in 4 cases. **Results :** The functional results were evaluated by the rating of LECHEVALLIER, with an average decline of 18 months, the overall results are good in 28%, average in 44% and bad in 28% of cases. Depending on the type of treatment, good and moderate results were noted in 78% of cases treated by internal osteosynthesis but with more skin complications such as necrosis in 24% of cases. **Discusion :** High-energy injuries of the tibial pilon, realize complex fractures, difficult to treat. The anatomical reconstruction and the restoration of joint congruence with a preservation of the coverage of the region are the only guarantors of the result. **Conclusion:** The natural evolution of pilon fractures is most often towards osteoarthritis, despite a reduction as anatomical as possible.

## Bilateral Open Calcaneal Fractures: Treatment with Ilizarov Frames

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**Introduction:** bilateral open calcaneal fractures call for a challenging treatment due to the nature of the injury, the degree of comminution and the soft tissue damage. **Aim:** herein; we present a case of a patient with bilateral open calcaneal fractures treated with the Ilizarov external fixator frames. **Patient and Methodology:** a 55-year-old male patient suffered injuries after a fall. Radiographic examination revealed a depressed fracture of the L3 vertebra and bilateral open calcaneal fractures. Following a CT scan with 3D reconstruction, the right calcaneus presented a grade III, and the left had a grade IV fracture, according to the Sanders classification. Successively, the fractures were close reduced and fixed with Ilizarov frames. The L3 fracture was treated conservatively with a Taylor lumbar brace. **Results:** the patient followed a physiotherapy program in bed for the first post-op week. For the next two months, he was allowed to be partially weight-bearing. Four months after surgery, radiographic control showed good evidence of fracture healing. At twenty weeks after surgery, the Ilizarov frames were removed. Five years after the injury, the patient can walk with a full range of motion in both ankle joints. **Conclusion:** we conclude that the Ilizarov frames provide a good solution for safe patient mobilization in the case of bilateral open calcaneal fractures.



## Type 1 pure open medial subtalar dislocation, case report

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**Aims:** To reduce the dislocation in an emergency and check stability. Perform good surgical trimming.

**Materials and methods:** A young man, 25 years old, was the victim of a road traffic accident resulting in open trauma to his right ankle. Clinically, the right ankle was deformed medially with exposure of the talus and a pale appearance of the toes with a 10 cm linear wound. Radiographs showed a pure medial subtalar dislocation. We performed a stable reduction and surgical trimming in the operating theatre. This was followed by immobilisation in a plaster cast.

**Results :** The postoperative course was good, with no ankle infection and progressive weight-bearing.

**Discussion :** Pure subtalar dislocation is a rare injury in trauma. It accounts for 1% of all dislocations.

Reduction must be carried out as a matter of urgency with good trimming. The subtalar joint is usually stable after reduction and osteosynthesis is not necessary. However, ligament healing requires strict immobilisation.

**Conclusion:** Subtalar dislocation is a rare injury resulting from violent trauma. Emergency reduction and well-managed treatment, combined with early rehabilitation, give good functional results.

## Analysis of functional outcome and return to physical activity (including Sports) following posterior malleolar fixation

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### Abstract

**Background:** Ankle fractures, particularly involving the posterior malleolus, are common orthopedic injuries with unclear management guidelines. The effectiveness of surgical intervention for these fractures is not well-defined.

**Objectives:** To evaluate the clinical and functional outcomes, including return to sports, following surgical treatment of posterior malleolar fractures.

**Methods:** This retrospective study analyzed patients with surgically treated posterior malleolar fractures, focusing on demographics, fracture patterns (classified by Mason), surgical details, and post-operative outcomes. Outcomes were assessed using union rates, complications, pain (Visual Analog Scale), functional outcomes (Olerud and Molander Score), and return to sports.

**Results:** Among 52 patients, the average O&M score was 79.3, indicating good function post-surgery. However, 54% reported residual pain, 35% had ankle stiffness, and 23% experienced swelling. Of those active in sports pre-injury, 65% returned to their previous level, 26% to a lower level, and 10% could not return. No significant differences in function or pain were observed across fracture types.

**Conclusions:** Surgical management of posterior malleolar fractures leads to satisfactory functional outcomes for most patients, but residual pain and limited return to sports are common. These findings highlight the need for clear pre-operative discussions regarding the potential for residual symptoms and activity limitations post-surgery

## Study of Clinical outcome of Trimalleolar fractures with reference to Posterior Malleolus

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Posterior malleolar fractures are often caused by pronation or supination injury with an external rotation component to the ankle. Historically, fixation of the posterior malleolar fracture was not mandated if it involved less than 25% of the tibial articular surface. This study primarily aims to evaluate the clinical outcomes of trimalleolar fractures with respect to posterior malleolar fixation irrespective of the size of the fragment. A prospective interventional study was undertaken in a tertiary care centre in India from October 2020 to December 2022, with a mean followup of 18 months. Pre-operative CT scans were done for all patients and classified according to Haraguchi and Lauge-Hansen. A total of consecutive 16 patients underwent the posterolateral approach to reduce the posterior malleolus, and these were fixed by a buttress plate or posterior to anterior screw. Clinical Outcome was measured with the AOFAS showed excellent result in 6 (37%) and good result in 8 (50%) cases. Buttress plating exhibited 3 excellent and 6 good results with no suboptimal outcome. Postero-anterior screw fixation showed 3 excellent and 2 good outcome. One patient had a superficial infection and one patient had a malunion. In conclusion, irrespective of the size of the posterior malleolus, fixation leads to a more robust construct with a stable syndesmosis enabling early rehabilitation & return to work. Posterolateral plating offers a more anatomical reduction but involves a wider surgical exposure.

## Treatment Wound Explosion the Back of Foot with Ilizarov Technique (Case Report)

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Explosive foot injuries caused by the impacts on the mine, especially those with bone defect and mucous tissues, mostly without exception, end with amputation

- The amputation is simple but not the only solution for a surgeon and a small case, especially for a young person
- The real question is when to amputate and when you save your foot
- The answer is individual
- I had no dilemma, I always saved and even when it seemed impossible as in this case

## Percutaneous tenorrhaphy in fresh ruptures of the calcaneal tendon: about 56 cases

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**Introduction:**Rupture of the calcaneal tendon is a very common injury in sports pathology, if the diagnosis of the

lesion is easy, its treatment is still controversial today. The two main therapeutic methods are conservative treatment and open surgical treatment. In order to minimize their

complications, Minimally invasive percutaneous tenorrhaphy techniques have been proposed, the results of which are encouraging. **Materials:**Retrospective study of a series of subcutaneous rupture of the calcaneal tendon spanning from April 2018 in June 2023 concerning 56 patients; 05 women and 51 men with an average age of 40 years. The cause

The main cause was a sports accident in 38 cases. The diagnosis was evident on examination in all patients. All the

Patients had a standard ankle x-ray confirmed by ultrasound. **Results:**Percutaneous tenorrhaphy was performed in all patients. The average follow-up is 48 months, we noted a resumption of professional activities effective on average 90 days after the intervention and that of sporting activities at 6 months on average. The local skin condition was judged to be good in all cases. Furthermore, the

complications were marked by a case of superficial sepsis treated with appropriate antibiotic therapy, a case of secondary rupture. **Discussion:**Combining the simplicity of orthopedic treatment and the reliability of conventional surgical treatment, percutaneous tenorrhaphy represents a technique of choice which allows excellent results to be obtained at the cost of rapid

intervention. **Conclusion:**This method is simple, effective, inexpensive, easily transmitted to younger people and makes it possible to obtain satisfactory results in the management of acute Achilles tendon ruptures.

## Closed medial subtalar dislocation: case report and literature review

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Subtalar dislocation is an uncommon lesion, defined by a simultaneous loss of congruence of the talo-calcaneal and talo-navicular joints. It is usually caused by high energy-mechanisms. Among the four types described in literature, regarding the foot position of the talus, medial dislocation is the most common and normally results from an inversion injury. A careful physical examination to assess neurovascular compromise must be performed and urgent reduction is mandatory. Most medial subtalar dislocation can be treated with closed reduction under sedation. Knowing the reduction maneuver is important for a rapid resolution, so that potential complications can be reduced. Reduction should be done with knee flexion to achieve relaxation of the gastrocnemius-soleus complex. The maneuver consists of plantar flexion, inversion and distal traction of the foot and then dorsiflexion and eversion with direct pressure on the cutaneous prominence of the talus. Immobilization with a non-weight bearing cast for four weeks, followed by a rehabilitation program is mandatory. After primary treatment, X-ray and CT scan should be performed to evaluate alignment of hindfoot and other associated lesions. We present a case of medial subtalar dislocation secondary to high-energy injury (height fall followed by inversion of the foot) in a 61-year-old man. The patient was successfully treated by closed reduction under sedation. Following X-rays showed good realignment of the foot and CT scan revealed no associated injuries. Subtalar medial dislocations, if adequately reduced, generally heal with conservative treatment, reducing the risk of significant complications.

## Bilateral symmetrical Tongue type Calcaneal fracture - Case report

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The tongue-type calcaneus fractures represent 25–40% of all calcaneus fractures.

We present an 18 year old male who jumped from a window of house from about 8 feet followed by bilaterally symmetrical tongue fracture of calcaneus causing skin tenting of posterior heel and blanching on both sides of heel despite offloading the posterior aspect by plantar flexion. This displacement may threaten the posterior soft tissue envelope and suggested the soft tissues at high risk for necrosis if not treated immediately.

An urgent surgical intervention was performed and the fracture was reduced by closed means using pointed reduction clamps and the fracture fixation was carried out by cannulated cancellous screws. The patient eventually returned to his pre injury level of activities and had full functional recovery. This case illustrates bilateral symmetrical calcaneal fractures presenting with skin involvement requiring prompt intervention to reduce the risk of serious complications such as open fracture from skin breakdown, poor healing, and a slow return to normal activities.

It also emphasizes the importance of advocating for expedient patient care to increase the odds of a good outcome and ensure patients are given high-quality care.

## A Downfall in the Loo: Unravelling a novel mechanism of Open Tendo Achilles Injury in squatting type Indian/ Asian style toilets following accidental slips into toilet holes

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**Introduction:** Open tendoachilles injuries are commonly associated with sports activities or accidents involving machinery. However, a novel mechanism of injury has been observed in Indian toilets, where individuals squatting over the toilet sustain such injuries due to sudden slips or falls. This study aims to explore this unique mechanism of injury and its implications on patient outcomes.

**Methods:** A retrospective analysis of 16 patients presenting with open tendoachilles injuries sustained in Indian toilets was conducted. Patient demographics, injury characteristics, mechanisms of injury, and associated factors were collected from medical records.

**Results:** The study included 16 patients (10 males, 6 females) with a mean age of 42 years. All injuries occurred while the patients were using Indian-style toilets, with the reporting of sudden slips or falls during squatting. The mechanism was studied in detail of a foot in dorsiflexion and foot in plantar flexion when it enters the toilet hole and the thin skin overlying the tendoachilles gets lacerated against the edge of the toilet seat. Most of the toilet seats in India are old and broken or have been poorly constructed. The injuries were characterized by varying degrees of soft tissue damage and open wounds.

**Conclusion:** This study highlights a previously unrecognized mechanism of open tendoachilles injuries occurring in Indian toilets. The unique biomechanics of squatting combined with slippery surfaces contribute to the increased risk of such injuries. Awareness of this mechanism is crucial for preventive measures, including modifying toilet designs or promoting the use of safety accessories.



## Techniques And Results of The Arthrodeses of The Ankle: About 20 Cases

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**Introduction :** Arthrodesis of the ankle, an operation intended to produce ankylosis of the tibiotalar joint. It remains the treatment of choice in major ankle joint lesions to restore perfect stability and stability. **MATERIELS ET METHODES :** We report a retrospective study of 20 cases of ankle arthrodesis collected at the service of over a period of 5 years. **RESULTS :** The treatment consisted of Meary's ankle arthrodesis in 13 of our patients, Meary associated with sub-talar and/or mid-tarsal staples in 5 patients, and 2 cases treated with pins, no patients were treated with external fixator, nail, or arthroscopy. With a mean follow-up of 1 year and 7 months (6-36 months) and according to the KITOAKA score we obtained 50% excellent and good results, 35% average result and 15% poor result. **DISCUSSION** The ankle joint (tibio-talar or instep) is a nested trochlear joint. It is constituted at the top by the tibio-peroneal "mortise" and at the bottom by the astragalian "tenon". The tibio-peroneal mortise has three articular faces: The lower face of the lower end of the tibia, concave from front to back on 70 ° of arc of circle, the external (or tibial) face of the medial malleolus and the face internal (or peroneal) of the external malleolus. **CONCLUSION** The talo-crural arthrodesis remains the "gold standard" intervention in the panel of therapeutic solutions for important articular ankle destruction. It helps to remove the pain and resume normal activity.

## Correction of sequelar deformity after ankle fracture-dislocation

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In this presentation, we exhibit the case of a 43-year-old woman, victim of a car accident resulting in a fracture/dislocation of her right ankle, in December 2019. After 48 hours, she underwent open reduction and osteosynthesis of the fibula with a bridge plate and transsyndesmotic fixation with 2 cortical screws, associated with osteotaxis with an external fixator due to marked tibiotarsal instability. After 6 weeks, the external fixator was removed, subsequently revealing a slight loss of reduction in the fibula fracture. Surveillance and physiatric treatment were maintained. At 7 months post-operatively, the patient underwent surgery again to remove the transsyndesmotic screws. After the aforementioned surgery, a marked clinical and radiographic worsening was noted, and the case was referred to the Foot and Ankle unit of our service. Clinically, the patient presented with a marked limp and functional limitation. In the radiographic study, severe shortening of the fibula and valgus deviation of the tibiotarsal joint were noted. In June 2023, underwent surgery to correct the deformity with a medial subtraction tibial osteotomy and elongation osteotomy of the fibula, combined with reinsertion of the deltoid ligament using trans-osseous tunnels. Currently, with approximately 2 years of evolution, the patient is asymptomatic, capable of total weight bearing, without limitations. Radiographically, presents with consolidated osteotomies and corrected mechanical axis.

## Arthroscopic Management of Posterior Talus Fractures: A Case Report

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**Introduction:** Fractures of the talus have an incidence of 3-6% regarding foot and ankle trauma. Fracture of the posterior talar process (FPTP) is rare and often not identified on plain radiographs, delaying its diagnosis.

**Case report:** A 52-year-old female patient presented with inability to walk, edema, and severe pain in the left foot after a simple fall. After imaging, she was diagnosed with a fracture of the posterior talar process. We opted to perform the following surgical approach: a posterior ankle arthroscopy revealed two dislocated postero-medial fragments with impingement of the flexor hallucis longus tendon; fracture reduction was accomplished and fixation was achieved with 2 cannulated compression screws. During follow-up, progressive mobilization and partial weight-bearing were initiated; currently, the fracture's reduction is maintained, and the patient presents satisfactory mobility.

**Discussion:** Up to 40% of FPTP are not identified, posing a high risk for complications. Depending on fracture pattern, conservative treatment vs surgical approach may be selected. In the present case, with a fragment of considerable dimensions and significant dislocation, reduction and fixation of the fracture was chosen. Although arthroscopic fixation may be associated with risks (tendon or neurovascular injury, compartment syndrome, others), it also minimizes complications associated with arthrotomy and surgical wound, allows direct visualization of the articular surface, removal of loose fragments and a faster recovery. Indeed, fracture reduction/fixation through arthroscopy has become an increasingly popular option considering its minimally invasive nature and undeniable benefits for the patient, although a learning curve related to the technique is required.

## Platelet-Rich Plasma (PRP) In the Treatment of Anterior Talofibular Ligament (ATFL) Lesion

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**Introduction:** There is a rising prevalence of anterior talofibular ligament (ATFL) injury and a demand for orthopedic techniques to improve the biological healing response is evident. Platelet-rich plasma (PRP) is an autologous derivative of whole blood that contains factors which stimulate growth and healing of various kind of tissues, especially soft tissues. It has shown to be an excellent method of treating sports injuries, but there is rather few researches on its impact on the anterior talofibular ligament (ATFL) injury treatment.

**Case presentation:** A professional football player suffered ankle injury, lateral ankle sprain, and was admitted in our facility. Ultrasound examination discovered partial tear of ATFL. The patient was scheduled for physical therapy and three PRP injections, with one week interval between each of them. Application itself was performed under ultrasound guidance.

**Outcome:** The patient reported significant improvement in functioning, but was advised to rest for a while, wearing an elastic bandage during activity and analgesics if necessary. Ankle ultrasound showed healing response of ATFL. PRP injections clearly relieved the symptoms. The patient was fully mobile with complete ankle movements and minimal pain on palpation above the ATFL.

**Conclusion:** PRP injections can be a promising treatment for ATFL injury, helping to improve natural healing response.

**Keywords:** anterior talofibular ligament, platelet-rich plasma, lateral ankle sprain

## Volar Flap in Syndactyly of the Adult

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**Introduction:** Syndactyly is one of the most common congenital anomalies of the hand and is more frequent in males (2:1), presented bilaterally in 50%. Surgical treatment consists in release of the merged components and is performed between the ages of six and 18 months. Surgery in adults is not frequent. **Material and methods:** We report a case of a 23-years-old man with family history of syndactyly with bilateral syndactyly between third and fourth digits. There was a complete and complex syndactyly with osseous fusion of the third phalanx, confirmed in X-rays and MRI, with a common collateral neurovascular bundle. Due to the complexity of the right hand deformity, only the surgery of the left hand was performed. **Results:** A volar rhomboid flap for commissure construction, a combination of dorsal and volar interdigitating zig-zag flaps and skin graft from the internal side of the arm was performed. The nail fold and the osseous fusion were separated with good cosmetic result and collateral neurovascular bundle was incorporated to the fourth digit where the cutaneous coverage was in a better condition. No postoperative complications occurred and hand therapy was not necessary. A good aesthetic appearance and a correct function of the digits was achieved except a slight extension defect of both distal phalanges. The patient satisfaction was excellent. **Conclusions:** A thorough history and physical exam should be performed on any patient presenting with syndactyly. Multiple techniques exist in the surgical release of syndactyly but there is not much bibliography in adults. We describe a surgical technique for syndactyly reconstruction with volar flap resulting good functional and cosmetic outcomes.

## The importance of neuromuscular activity in osteoarthritis of the thumb

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**Introduction:** Stability of the thumb carpometacarpal joint is based on equilibrium between its ligaments, muscles and joint congruity. There are extrinsic and intrinsic muscles that intervene in muscle contraction and they have to be in perfect balance. The goal of this study is to analyze the neuromuscular activity on the thumb during pinch and grasp. **Methods:** A prospective study was performed on 97 patients (26 male and 71 female), divided in two groups (68 healthy group and 28 patients with symptomatic trapeziometacarpal osteoarthritis). The participants performed isometric contraction in terminal and subterminal key pinch, grip in neutral position while superficial electromyographic activity of 6 channels and an isometric dynamometry was registered. We recorded and analyzed the activity of the first dorsal interosseous, extensor pollicis longus, flexor pollicis longus and adductor pollicis muscles. The results were analyzed with T-Student ( $p < 0,05$ ).

**Results:** As the age of the participants increases, a reduction of the activity of the intrinsic muscles and an increase of the activity of the extrinsic muscles were observed in women, when we compare the arthritic group and the healthy group, especially in key pinch. In men, when we compared both groups, we observed the opposite results. **Conclusion:** The study shows a different neuromuscular pattern related with gender and age influences in the loss of strength of the thumb. We can consider that intrinsic muscular potentiation with physiotherapy could be useful in initial stages and could avoid muscular imbalance that causes the characteristic deformity of the thumb (dorsoradial subluxation). The treatment in women should be managed to improve the activity of the first dorsal interosseous muscle.

## Giant Cell Tumour of Flexor Pollicis Longus Tendon Sheath: an uncommon case report

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Giant cell tumours of tendon sheath are uncommon, benign, rarely malignant, soft tissue tumours arising from tenosynovial sheath and periarticular soft tissue. It is the second most common tumour of hand and feet. They usually present as painless, slow growing masses with some restriction of movement. Histopathological diagnosis is gold standard, although preoperative fine needle aspiration cytology, plain radiographs, MRI help in narrowing down the differentials. GCTTS although benign is notorious for having a high rate of recurrences, with most important risk factors being adjacency to joint and incomplete excision. Adequate marginal excision forms the mainstay for managing these tumours. Adjuvant radiotherapy has found some role in treating and decreasing chances of recurrences. A 55 year old lady was brought to the outpatient department with history of painless, gradually progressive swelling on volar aspect of thumb. Swelling was well defined with a smooth surface. Overlying skin showed no signs of local inflammation or adherence. Plain radiographs showed soft tissue shadow with some articular bony erosions. A USG guided FNAC and MRI showed a picture of GCTTS. An excisional biopsy was done and confirmed the diagnosis. GCTTS is a benign entity with a slow course of evolution, although uncommon, should be kept as differential for swellings of hand and feet. Complete excision with no evidence residual tumour is diagnostic as well as curative. A regular follow up is essential on account of high rates of recurrences.

## Preliminary Results of 1st Metacarpal Extensive Osteotomy in Treating Thumb CMC Joint Arthritis

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**Introduction:** Joint laxity is considered the major factor for the progression of osteoarthritis (OA) of the thumb carpometacarpal (CMC) joint. First metacarpal extensive osteotomy is a procedure reported with the effects of stabilizing the CMC joint and improving pain. The purpose of this article was to report surgical outcomes of extensive osteotomy in treating thumb carpometacarpal joint arthritis. **Methods:** The Medical records, radiographs, and clinical data of 9 consecutive patients (9 thumbs) who received first metacarpal extensive osteotomy in treating thumb carpometacarpal joint arthritis in our hospital between 2020 and 2023 were collected. Patients' demographics, union rate, complications, DASH score, visual analogue scale (VAS) for pain, patient-rated wrist evaluation (PRWE), and pinch power were collected and analyzed. **Results:** All fingers achieved uneventfully bony union(100%). The VAS for pain, DASH score, PRWE, and pinch power improved from preoperatively to an average of 12.57 months follow-up after surgery ( $P<0.05$ ). The postoperative thumb range of motion had no difference compared to the preoperative range of motion. **Discussion:** The mechanism of first metacarpal extensive osteotomy is to unload the degenerated palmar ulnar compartment and shift the contact area to the healthier dorsal compartment in normal and moderately arthritic joints. However, The ineffective ROM and significantly improved postoperative function suggest this procedure is an ideal surgical option for patients who are in moderate to heavy labor. Some studies also reported a high union rate and favorable results. **Conclusion:** First metacarpal extensive osteotomy is an effective and simple procedure to treat early and moderate CMC arthritis.



## Surgical treatment of distal radial fractures with volar LCP plates - our experience

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Fractures of the distal radius are the most common fractures of the upper extremity. They account for up to 20% of all fractures of the upper extremity. There is a bimodal distribution of these fractures: in younger population from 18 to 25 years old, and in the older population predominantly after the age of 65 years. These are very often complex fractures and are often approached superficially. The aim of this paper is to emphasize the importance of proper reduction and fixation of the complex intraarticular fractures of the distal radius, which cannot be achieved non-operatively, given the fact that distal radial fractures represent medical, social and economic burdens of our community. Distal radial fractures can be treated non-operatively or surgically. Different methods of surgical treatment include: reduction and fixation with Kirchner wires, or with a plate and screws or by external fixation. Our patients were treated with open reduction and fixation with LCP plates. Reposition and fixation of the fracture was checked intraoperatively under a C-arm x-ray machine. The results were evaluated after 3 and 6 months by measuring the range of motion and grip strength. The treatment of distal radial fractures with LCP plates gives more than satisfactory results, considering that in most cases these are severe articular and comminuted fractures. In the period from January 2020 to December 2023, 217 patients were treated with open reduction and fixation with the LCP plates. In this paper, we will be presenting also some of those cases.

## Dieterich's disease of the metacarpal head – A case report of a very rare disease

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Introduction: Osteonecrosis of the metacarpal head, also known as Dieterich's disease or Mauclaire disease, is a rare entity appearing in adolescent characterized by progressive damage to the metacarpal head, affecting hand function. There are very few cases reported in the literature with no definitive treatment options. Case Report: A 16-year-old male with no trauma presented with pain and restriction of movements of his right index finger metacarpal head, was diagnosed as idiopathic avascular necrosis or dieterich's disease showcasing challenges in diagnosis and management. Despite negative laboratory investigations and characteristic imaging findings, the etiology remained unidentified. He underwent surgical intervention, involving subchondral decompression by curettage and autogenous cancellous bone grafting from the distal radius with bone marrow aspiration concentrate. He was immobilized with mini external fixator for 6 weeks for bone healing and was mobilized following removal and was followed up regularly for 2 years. Results: After 2 years patient is comfortable with no pain, swelling and almost full range of the metacarpophalangeal joint. He is comfortably back to his daily activities. He subsequently developed secondary arthritis of metacarpal head but no symptoms. Conclusion: This case emphasizes the importance of individualized treatment approaches. Though uncommon Dieterich's disease should be considered as a probable diagnosis in metacarpal pain and the need for early recognition and tailored management of idiopathic avascular necrosis to preserve hand function effectively and good outcome.

## Combined Median and Ulnar Nerve Compression Neuropathy due to Pigmented Villonodular Synovitis of the Wrist

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Pigmented Villonodular Synovitis (PVNS) is a benign and chronic tumor that causes proliferation of the synovial membrane. Its appearance on the wrist is rare, and there are only a few cases reported in the literature, that develop with a simultaneous compression of the cubital and median nerve. The authors present a case of PVNS of the wrist, which resulted in simultaneous compression of the median and cubital nerve, in the carpal tunnel and Guyon's canal, respectively.

A 84-year-old patient, present with pain and sensorial complaints of the five fingers of his right hand. Phalen test was positive. No motor deficits nor atrophic muscles was seen. A soft tissue mass was palpated on volar surface of the wrist. Electromyography showed distal compression of median and ulnar nerve. Surgical exploration was performed through one volar incision: a lipomatous mass with extension into both carpal and Guyon's tunnels and exuberant synovitis of the tendons sheath was shown. Mass was excised, extensive tenosynovectomy and release of the Carpal tunnel and Guyon's canal associated with cubital and median neurolysis were performed. Histopathological examination confirmed the diagnosis of PVNS.

After surgery, the patient had a significant improvement in pain with resolution of the sensorial symptoms.

Although very rare, tumors can be the cause of double nerve compression and its diagnosis requires a high level of suspicion due to the absence of characteristic neurological symptoms. With this case, the authors demonstrate that mass excision with double tunnel release leads to pain improvement and resolution of neurological symptoms.

## The Use Of fibrin Glue in Peripheral Nerve Repair Comparative, Prospective, and Controlled Study

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Fibrin glue is gaining popularity in the field of peripheral nerve surgery as a substitute for traditional microsurgical repair. It has the advantages of being technically simple to use, requiring less tissue manipulation, and shorter operating periods for nerve reconstruction.

Few clinical studies directly compare fibrin glue with sutures for nerve repair; the heterogeneity of clinical scenarios makes comparison with reported results of suture repair difficult.

This is a prospective comparative study carried out on 32 patients divided into two groups, 17 patients (micro suture with fibrin glue) and a control group of 15 patients (micro suture), the average age is 29 years, 16 ulnar nerves, 12 median nerves and 4 combined lesions (median and ulnar). The average follow-up of the series is 18 months.

Both repair groups had regained similar motor and sensory functions at the final follow-up. More specifically, 75% of the suture repairs and 82% of the fibrin glue repairs regained a useful motor recovery (i.e., grade M3 or higher). For sensory recovery, 61% of the suture repairs and 73% of the fibrin glue repairs achieved a sensory function of grade S3 or higher. No significant differences were found in grip strength, electrophysiologic outcomes, or postoperative complications.

Our findings indicate that nerve regeneration may be similar in fibrin glue repairs and suture repairs, and a combination of both. Combining fibrin glue with positional sutures allows for a precise realignment of the nerve fibers and yields sufficient strength to prevent dehiscence.

## Management of Madelung deformity in late adolescent computer professional: Interesting case report with review of literature

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Madelung deformity is a developmental progressive deformity, usually bilateral, of the distal radioulnar joint and the radiocarpal joint in which the distal articular surface of the radius faces volarly and ulnarly secondary to a growth aberration in the corresponding distal radial physis with associated proximal subsidence and triangular deformation of the carpals. It becomes clinically evident in the post pubertal growth spurt in adolescence, more common in females. Although MRI is advocated for identifying associated thickened Vicker's ligament, clinically and plain radiograph examination usually suffices. Depending on age of presentation, degree of functional impairment and pain, numerous treatment options are described. 20 year old gentleman presented to the out patient department with mechanical pain in the dominant right wrist with painful and restricted movements especially supination and dorsiflexion. Plain radiographs showed features consistent with Madelung deformity and a skeletal maturity. A Sauve-Kapandji procedure was performed. Two year follow-up shows good bony union between ulnar head and radius with improvement in functional range of motion and grip strength in a painless wrist. Madelung deformity is a rare deformity which causes considerable pain and functional limitation across the wrist joint. Management should be tailored to patients symptoms and age of presentation. Sauve-Kapandji is an easy and rewarding procedure if done in correctly selected patients.

## Giant lipoma of the palm of the hand with nerve compression. About an observation.

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**Introduction:**Lipomas are rare and constitute 1 to 4% of hand tumors. They are generally asymptomatic, can be unsightly and sometimes cause nerve compression through mass effect, manifested by sensorimotor disorders downstream. **Material:**We report a case of a lipoma located in the palm of the left hand in a 34-year-old woman. This tumor occupies the lateral part of the palm extending towards the 1st corner and the base of the 2nd, 3rd metacarpal. This mass had been evolving for 5 years and increased in volume over the past year, caused neurological signs such as paresthesias at the level of the pulp of the 2nd and 3rd fingers. Ultrasound revealed the fatty nature of the tumor. The MRI suggested a lipoma without signs of aggressiveness. Surgical excision under locoregional anesthesia was carried out; the tumor was multilobed measuring 6cm in long axis. Anapath confirmed the lipomatous nature of the lesion. **Results;**The postoperative course was simple, with good healing and complete disappearance of the neurological disorders, without any recurrence at the last follow-up: 36 months. **Discussion:**The location of lipomas is rare at the level of the hand remains rare, it is a proliferation of normal fat cells, generally asymptomatic but sometimes when they are large, become aesthetically bothersome when associated with signs of nervous irritation. The contribution of imaging is fundamental, the treatment is surgical based on excision of the tumor allowing the noble elements to be decompressed. The anapathological examination confirmed the benignity of the lesion. **Conclusion:**Lipomas of the hand are rare mesenchymal tumors, closely related to vasculonervous elements leading to sensorimotor disorders and requiring great caution during dissection

## Abdominal pedicled flaps in hand reconstruction – a case report

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Finger injuries are one of the most affected when it comes to hand injuries especially in younger working population and children. Injuries are usually obtained at work or during leisure time. The most challenging when it comes to treatment among others are the soft tissue coverage of the skin defects of the hand mostly of the fingers because of the specific anatomy of the fingers. One of the option are abdominal pedicled flaps. There are different types of the above mentioned flaps. In our study, we will be presenting a case of a young male 12 years old who injured the distal phalanx of the third finger of the left hand on a firecracker. There was a circumferential skin defect of the distal phalanx with the bone which was exposed but with intact deep flexor of the finger. We decided to do a supra-umbilical abdominal pedicled flap. After adequate treatment protocol, physical therapy was conducted. The patient recovered well without complications. At one year follow-up, he had full range of motion at the DIP and PIP joints. The surgery was done by a surgeon with no special microsurgical expertise. Key words: abdominal pedicled flaps, soft issue coverage, finger, hand injury reconstruction.

## Surgical management of an extraordinary case : bilateral pure perilunate dislocation.

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Introduction:

Perilunate dislocation of the carpus is an unusual injury, requiring high-energy trauma. The simultaneous bilateral form is so rare, with only a few cases mentioned in the literature. We present the case of a patient with an open volar dislocation of the right wrist associated with a closed dorsal dislocation of the left wrist and distal radioulnar subluxation

Case:

A 30-year-old, right hand dominant male, suffered injuries to both wrists after being involved in a high-speed car accident. Examination of the patient revealed diffuse swelling and tenderness to both wrists with a lacerated wound over the dorsum of right wrist. Anteroposterior and lateral X-rays of both wrists were obtained, which showed bilateral perilunate pure dislocations: volar in the right side and dorsal the left side combined with a dorsal subluxation of the distal radioulnar joint

Discussion:

Perilunate dislocations are relatively rare injuries involving approximately only 7% of all injuries of the carpus. It is often overlooked in primary evaluations, approximately 25% of perilunate injuries were missed. A better comprehension of the injury's mechanism and its full extent has led to better management strategies. It is recommended in the literature, that the best treatment of these injuries is open reduction, restoration of carpal bones relationship, repair of the ligaments and a proper rehabilitation and physiotherapy program.



## Surgical management of translunate arc injuries : about 2 cases

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### Introduction:

Translunate volar perilunate dislocations are extremely rare, with few documented cases. Only eight instances of volar translunate perilunate dislocation have been described in the literature.

Case 1 : A 20-year-old man presented with left wrist pain and swelling after a fall from a vehicle, landing on an outstretched right hand. Radiographs and a CT scan identified scaphoid, lunate, and triquetral fractures, along with a volar perilunate dislocation.

Case2 : A 37-year-old man was presented to us with pain and swelling of the left wrist following a fall from 2m landing on the ground with outstretched left hand. He came to us after 4 week. Radiographs of the wrist showed a volar perilunate dislocation of the left wrist with scaphoid fracture. CT scan detected a coronal plane fracture of the lunate.

Surgical treatment was performed with a dorsal approach, including scaphoid and lunate fracture fixation and lunate stabilization with K-wires. The wrist was immobilized for 6 weeks, intense physical therapy started after K-wires removal.

### Discussion:

A perilunate fracture-dislocation includes dislocation of the carpus from the lunate. Johnson divided these injuries into lesser arc and greater arc. Bain introduced the translunate arc concept in a case series of three patients, depicting a path through the lunate causing lunate fracture alongside perilunate injury. Treatment focuses on lunate reduction and fixation, combined with addressing greater and lesser arc injuries.

### Conclusion :

Early diagnosis, prompt reduction, rigid fixation, and repair of both arc injuries can lead to optimal functional recovery.

## New percutaneous pinning technique for PIP joint dislocation-fractures with the volar bone fragment of the base of the middle finger phalanx

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**Introduction:** For PIP joint dislocation-fractures with a volar bone fragment of the base of middle phalanx, it may be sometimes difficult to fix this fragment due to the fragility or comminution. We developed percutaneous surgery for such fractures, we will introduce the surgical techniques and tips. **Patient and Methods:** Surgery was performed for 2 cases. Surgical Procedure is as follows; Under anesthesia, a small Kirschner wire is first inserted from the dorsal diaphysis of the proximal phalanx toward the palmar side of the PIP joint under fluoroscopy to act as a blocker for the volar bone fragment of the middle phalanx. Secondly, this volar bone fragment of the middle phalanx is pressed against this blocker to control this fragment under fluoroscopy. Thirdly, the middle phalanx is manually corrected and applying pressure toward the volar bone fragment. Finally, some Kirschner wires are inserted for fixation of fracture. After bone healing, range of motion exercises were started. **Results:** Bone union was achieved and there was no pain. The range of motion of PIP joint was approximately 80% compared to the unaffected side. **Discussion:** If a PIP joint dislocation-fracture is accompanied by a large intra-articular bone fragment, there may be no objection to open reduction and fixation, but fixation methods may be sometimes difficult if the bone quality is poor or the bone is severely comminuted. This method indirectly fixes bone fragments through percutaneous surgery, so this technique is a relatively easy and safety method for these PIP joint dislocation-fractures avoiding major complications.

## Occupational air knife injury of the hand – Management and its functional outcome

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**Introduction:** Hand injuries, including open fractures, joint dislocation, and tendon damage, present intricate challenges in diagnosis and management. This case report details the case of a 35-year-old male who sustained tyre burst workplace accident, resulting in a grade 3B open comminuted fracture with sagittal split of the entire 3rd metacarpal with joint dislocation, and extensor tendon injury. The necessity for immediate surgical intervention arose from the severity of trauma and the imperative to salvage hand function. **Case Presentation:** Upon evaluation, the patient presented with significant open wound, entire metacarpal sagittal split fracture with joint dislocation, and tendon injury in the right hand. Surgical intervention was promptly initiated to address the extensive trauma and preserve hand functionality. The procedures performed included thorough wound debridement, precise mini-fragment screw fixation for reconstructing the metacarpal head and to maintain the length of metacarpal and tendon repair targeting the 3rd metacarpal. Intraoperative findings revealed extensive damage, particularly an 80% cut extensor tendon injury in Zone 5 of the 3rd metacarpal. Surgical techniques were adapted to address these specific injuries while considering the patient's medical history, including a seizure disorder. **Results:** Patient was followed up for 18 months with early return to work, no functional disability and full ROM of the MCP joint. **Conclusion:** Despite the complexity of the injuries and the patient's medical history of seizure disorder, the individualized surgical interventions and postoperative care facilitated positive outcomes, underscoring the significance of adaptable and personalized management strategies in navigating intricate hand injuries.

## Improved Iliac Exposure and Abductor Function with an Extended Posterior Approach for Revision Total Hip Arthroplasty

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**Introduction:** Revision total hip arthroplasty (rTHA) necessitates extensive surgical exposure. The posterior approach, the most common approach, splits the gluteus maximus muscle in-line with its fibers. However, proximal iliac exposure is limited by the superior gluteal neurovascular bundle (SGB). As abductor weakness is reported with the posterior approach, and since rTHA is associated with a higher risk for instability, we report on the extended posterior approach to facilitate reconstruction while minimizing the risk of iatrogenic SGB injury. **Methods:** We retrospectively analyzed 13 patients undergoing an extended posterior approach for rTHA by a single surgeon. The extensile posterior approach (Adelaide approach) mobilizes the entire gluteus maximus posteriorly and rotates the gluteus medius anteriorly by recessing it from the posterior gluteal line. This allows for excellent iliac exposure proximal to the sciatic notch while allowing for real-time assessment of SGB tension, minimizing the risk of injury to the SGB, and preserving abductor function. We compared this cohort to a control group who underwent rTHA via a traditional posterior approach by the same single surgeon. **Results:** None of the patients in the study group exhibited instability or abductor dysfunction; post-op bracing was not used. Intra-operative electromyography (EMG) was utilized in one case to monitor the gluteus medius during various timepoints (e.g. hip dislocation, anterior femoral translation, and notch exposure) and demonstrated absence of EMG signal change during each maneuver. **Discussion and Conclusion:** The extended posterior approach provides enhanced proximal iliac increased exposure in rTHA while protecting the SGB and preserving abductor function.

## Osteoporotic Type B2 Periprotetic Hip Fractures - Femoral Revisions with Uncemented Revitan stems, Cables, Dall Milles Plates

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**INTRODUCTION:** Plates and multi-cables synthesis strengthens femoral osteoporotic structure, in uncemented hip revisions. **MATERIAL AND METHODS:** We reviewed 245 consecutive femoral revisions implanted in our clinic (2006-2023). In this article, we present only revisions with osteoporotic bone stock and diaphyseal type B2 femoral fracture using curved Revitan rod - 80 cases. In the outbuilding, we used Dall Milles plates and cables to achieve primary stability. These 80 hips at 2 to 15 years follow-up (mean 63 months; range, 24 to 114 months) survived without further revisions. The double plates Dall Miles in 14 cases, the single plates in 31 cases were with 7 holes, in 17 with 9 holes and in 3 with 5 holes and we added 3-9 cables to get a solid set. **RESULTS:** Patients were actively followed at regular intervals to determine revision status and outcome measures, including Robin, WOMAC, and radiographs criteria's. During the follow-up period, 3 hips were dislocated. A closed reduction was made in all cases. In 3 cases with poor bone structure, surgical indication is at the limit of the indication for the total femur. **CONCLUSION:** The curved femoral Revitan stem provides good stability by using a thick and short stem that is at least 6 cm distally locked into a strong femoral structure. Only rotational stability during operation could decide the number of cables and the length of the Dall Miles plates, or the need for additional plates.

## Safety of tranexamic acid regarding the risk of deep venous thrombosis after direct anterior total hip arthroplasty without routine chemical thromboprophylaxis

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Tranexamic acid (TA) has been used to reduce blood loss during total hip arthroplasty (THA). A major concern is that its use can increase the risk of deep venous thrombosis (DVT). Although many studies have reported that TA does not increase the incidence of DVT, most of them applied routine chemical thromboprophylaxis, thereby masking the increasing effect of TA on DVT risk. Recently, some studies have shown that DVT after direct anterior approach (DAA) THA was less than THA using the posterior approach (PA).

The purpose of this study was to investigate the incidence of postoperative DVT following DAA THA when routine administration of TA and no routine chemical thromboprophylaxis are applied.

83 patients (85 hips) who underwent primary DAA THA in supine position were retrospectively reviewed. A dose of 1g TA was administered intravenously 15 minutes before the skin incision. No patients underwent routine chemical thromboprophylaxis. All patients were examined for DVT by bilateral ultrasonography on postoperative day 7. Thrombosis was classified as proximal (pelvic, femoral, popliteal) or distal (calf).

Distal DVT was diagnosed on day 7 postoperatively in 3 (3.5%) hips. Proximal DVT or symptomatic pulmonary embolism did not occur in any patients.

Previous studies found that the incidence of DVT on postoperative day 7 after PA THA was about 18% when routine use of tranexamic acid and no routine chemical thromboprophylaxis were applied.

Although no direct comparison has been performed, the incidence of DVT in DAA was less than that in PA despite the use of TA.

## Economy benefits of tranexamic acid in primary THA: a prospective study

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**Background and Objectives:** Tranexamic acid (TXA) is an antifibrinolytic substance that chemically belongs to the group of e-carboxylic acids. There has been recently an increasing interest in TXA in elective major joint replacements. The total hip arthroplasties (THA) are associated with perioperative blood losses. TXA reduces postoperative blood losses and consequently leads to less frequent blood transfusions. This has an impact on the economic burden for the health care system. Increased blood loss could lead to longer lengths of stay at the hospital and the connected economic consequences. **Methods:** In this prospective study, we compared the mean hospital cost (room & board), costs associated with blood transfusion and wound complications between patients who did and did not receive TXA topically in primary THA. **Results:** The use of topical TXA resulted in a significant reduction in the number of blood transfusions required. Although there was no significant impact on the average length of hospital stay. Patients who did not receive topical TXA needed 81% more blood transfusions. Additionally, those patients experienced a 47% higher rate of wound complications compared to those who received TXA topically. Moreover, the mean total hospital cost was found to be 6% higher in patients who did not receive TXA topically. **Conclusion:** The findings of the study indicate that the use of topical TXA led to lower mean hospital total costs following primary total hip arthroplasty.

## A Prospective Double-Blinded Randomised Controlled Trial comparing the Direct Superior Approach versus Posterior Approach for Total Hip Arthroplasty

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**Introduction:** The direct superior approach (DSA) is a modification of the posterior approach (PA) that preserves the iliotibial band and short external rotators except for the piriformis or conjoined tendon during total hip arthroplasty (THA). The objective of this study was to compare postoperative pain, early functional rehabilitation, functional outcomes, implant positioning, implant migration, and complications in patients undergoing the DSA versus PA for THA. **Materials and Methods:** This study included 80 patients with symptomatic hip arthritis undergoing primary THA. Patients were prospectively randomised to receive either the DSA or PA for THA.

### Results:

There were no statistical differences between the DSA and PA in postoperative pain scores ( $p=0.312$ ), opiate analgesia consumption ( $p=0.067$ ), and time to hospital discharge ( $p=0.416$ ). At two years follow-up, both groups had comparable Oxford hip scores ( $p=0.476$ ); Harris hip scores ( $p=0.293$ ); Hip disability and osteoarthritis outcome scores ( $p=0.543$ ); University of California at Los Angeles scores ( $p=0.609$ ); Western Ontario and McMaster Universities Arthritis Index ( $p=0.833$ ); and European Quality of Life questionnaire with 5 dimensions scores ( $p=0.418$ ). Radiographic analysis revealed no difference between the two treatment groups for overall accuracy of acetabular cup positioning within Lewinnek's safe zones ( $p=0.687$ ) and femoral stem alignment ( $p=0.564$ ). RSA revealed no difference in femoral component migration ( $p=0.145$ ) between the groups at two years follow-up.

### Conclusion:

There were no differences between patients undergoing the DSA versus PA for THA with respect to postoperative pain scores, functional rehabilitation, patient-reported outcome measurements, accuracy of implant positioning, and implant migration at two years follow-up.



## Hip-Spine Evaluation: A Clinical Practice for Total Hip Arthroplasty in Indian Scenario

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**Introduction:** Dislocation following THA is one of the most devastating complications. Acetabular component malpositioning is one of the leading causes of dislocation in THA even when placed in Lewinnek safe zone. Dislocations are common with patients who have altered sagittal spinal profile due to lumbar spinal fusion(LSF) and spinal stiffness. The relationship between the spine and pelvis is given by The Simple Hip-Spine classification by Vigdorichik et al. **Materials and methods:** This prospective study conducted from Jan 2023 to Dec 2023 included patients aged between 18 to 80years who underwent primary THA. Revision THA was excluded. Patients were evaluated preoperatively with standing and sitting lateral spinopelvic radiographs and classified using hip spine classification. **Results:**182 hips in 160 patients were evaluated for hip spine classification. 30% were females. 1/3rd patients underwent robotic assisted THA. Mean age was 48years. Most common indication was osteonecrosis of femur (86%). Breakdown of the patients by hip spine classification group 1A-160(88%), 1B-11(6%), 2A-3(2%), 2B-8(4%). Not all patient with spinal stiffness had spinal instrumentation. Nearly1/4th patients had an exaggerated lumbar lordosis in standing positioning. Acetabular component was placed as per the recommendations and no incidence of dislocation following THA in early postoperative period(follow-up of 3 month). **Discussion:**Mean age in western population was 64 and most common indication was primary osteoarthritis of hip unlike our population. Spinopelvic pathology was seen in 43% in western world unlike Indian scenario where it is only 12%.**Conclusion:**Evaluation for spinopelvic pathology, classifying and component positioning as per recommendations can prevent dislocation after THA.

## The Iatrogenic Bone Trauma and Soft Tissue Injury (BOSTI) Classification System:

### A Prospective Cohort Study comparing Robotic-arm assisted versus Conventional Total Hip Arthroplasty

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**Introduction:** The primary objective of this study was to develop a validated classification system for assessing iatrogenic bone trauma and soft tissue injury during total hip arthroplasty (THA). The secondary objective was to compare macroscopic bone trauma and soft tissue injury in conventional THA (CO THA) versus robotic-arm assisted THA (RO THA) using this classification system. **Methods:** This study included 30 CO THAs versus 30 RO THA performed by a single surgeon. Intraoperative photographs of the osseous acetabulum and periacetabular soft tissues were obtained prior to implantation of the acetabular component. The intraoperative photographs were used to develop the proposed classification system. Interobserver and intraobserver variability of the proposed classification system were assessed. **Results:** The iatrogenic bone trauma and soft tissue injury (BOSTI) classification system provides a score between 28-100 points that summates bone trauma scores from the four acetabular quadrants and periacetabular muscle damage. RO THA was associated with improved BOSTI scores ( $p=0.004$ ) and more pristine acetabular surfaces in the superior anterior ( $p=0.001$ ) and superior posterior quadrants ( $p<0.001$ ) of the acetabulum compared with CO THA. RO THA had a non-statistically significant trend towards reduced muscle injury to the gluteus maximus ( $P=0.52$ ); gluteus medius ( $p=0.78$ ) compared with CO THA. **Discussion:** The proposed BOSTI classification is a reproducible grading system for stratifying iatrogenic bone trauma and soft tissue injury during THA. Patients undergoing RO THA had improved BOSTI scores and reduced acetabular bone trauma compared with CO THA.

## Hip arthroplasty revisions: the why of things

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Introduction :No surgeon can boast of not having had to repeat at least one of his arthroplasties during his career, and this despite the spectacular advances in science, ancillaries and surgical techniques in this area, there is certainly no zero risk. not but the primary goal remains to minimize the possibilities of failure by knowing the factors leading to this. Material and method :we will share with you clinical cases of hip arthroplasty failures, trying to illustrate all the possible etiologies, namely: wear, aseptic loosening, recurrent dislocations, infections, perioperative fractures, conflicts with the soft parts, peri-articular calcifications, inequality in length, lack of rotation, etc. Results :in all clinical cases the cause was identified and a revision with or without implant change was carried out successfully. Conclusion : there are obviously intrinsic factors on which it is necessary to take account specific measurements (vertebral status, neurological status, ASA score, osteoporosis, secondary trauma...) but also factors linked to the environment of the intervention, to the chosen implant, to the operator himself, which can be avoided by an analysis of the surgical strategy before any arthroplasty, in order to reduce the rate of Revision .

## Legally sound, Evidence-based Informed Consent Form for Total Hip Arthroplasty

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**Introduction:** Informed consent documentation is often the first area of interest for lawyers and insurers when a medico-legal malpractice suit is concerned. However, there is a lack of uniformity and standard procedure for obtaining informed consent for total hip arthroplasty (THA). We aimed to develop a solution for this need for a pre-designed, evidence-based informed consent form for THA cases. **Methods:** We extensively reviewed the literature on the medico-legal aspects of THA, medico-legal aspects of informed consent, and medico-legal aspects of informed consent in THA. We then conducted semi-structured interviews with orthopaedic surgeons and patients who had previously undergone THA in the previous year. Based on all of the above, we developed an informed consent form that was evidence-based. We then had the form reviewed by a legal expert. The final form was utilised for THA cases at our institution for 1 year. **Results:** Legally sound, evidence-based Informed Consent Form for Total Hip Arthroplasty is given in Form A. **Conclusion:** The use of legally sound, evidence-based informed consent for total hip arthroplasty cases would be beneficial to orthopaedic surgeons and patients alike. It would uphold the rights of the patient, and promote open discussion and transparency. In the event of a lawsuit, it would be a vital document in the defence of the surgeon and withstand the scrutiny of lawyers and the judiciary.

## Comparison of accuracy between Computed Tomography-Based Navigation and Robotic-Arm Assisted Surgery for total hip arthroplasty after pelvic osteotomy using 3D image analysis software.

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**Introduction:** Computed tomography-based navigation and robotic-arm assisted surgery can improve the accuracy of implant placement for total hip arthroplasty (THA). However, few reports compare their usefulness in cases with complex pelvic morphology, such as after pelvic osteotomy. In this study, we compare the accuracy of cup positioning of computed tomography-based navigation (NAVI) and robotic-arm-assisted surgery (MAKO) in THA for post-pelvic osteotomy cases. **Methods:** Post-pelvic osteotomy cases in which THA was performed using either NAVI or MAKO between 2018 and 2023 at our institution were included. Patient information was investigated. In addition, preoperative planning and postoperative computed tomography images were imported into 3D image analysis software (ZedHip, LEXI), and the pelvic coordinate system was matched. Then, the accuracy of cup placement was calculated, evaluating the absolute values of displacements in radiographic inclination, radiographic anteversion, Anterior-Posterior, Medial-Lateral, and Superior-Inferior directions ( $\Delta RI$ ,  $\Delta RA$ ,  $\Delta AP$ ,  $\Delta ML$ ,  $\Delta SI$ ). **Results:** Each group included 24 patients, respectively. There were no significant differences in age at surgery, gender, or body mass index between the two groups. Cup placement accuracy was significantly more accurate in the MAKO group than in the NAVI group only for  $\Delta RI$  ( $1.6^\circ$  vs.  $3.8^\circ$ ; P value=0.013). However,  $\Delta RA$ ,  $\Delta AP$ ,  $\Delta ML$ , and  $\Delta SI$  showed no significant difference ( $1.6^\circ$  vs.  $2.2^\circ$ ; P value=0.131, 1.1mm vs. 1.1mm; P value=0.915, 1.8mm vs. 1.8mm; P value=0.64, 1.6mm vs. 1.8mm; P value=0.328). **Conclusion:** In THA, after pelvic osteotomy, MAKO can help place the cup as accurately as or more accurately than NAVI.

## Early postoperative outcomes of direct anterior approach versus anterolateral Watson Jones approach in supine total hip arthroplasty – a prospective single center study.

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### Background

There are several approaches to total hip replacement, and each has their respective advantages and disadvantages.

This prospective study aimed to assess the difference in early clinical and radiological outcomes between the DAA and AL approach.

### Methods

100 hips via DAA and 103 via anterolateral approach were operated by high volume surgeons. Operating time, blood transfusion, hemoglobin drop, amount of opioid analgesics, early complications and post-op hospital stay, were recorded. Radiological evaluation and complications were analyzed.

### Results

We found no statistical difference in operating time (58,4 vs. 62,1 minutes,  $p > 0.05$ ), blood transfusion (6 vs 8,  $p > 0.05$ ) hemoglobin drop (120 vs. 127 mg/l,  $p > 0.05$ ) and length of hospital stay (6,1 vs. 7,3 days,  $p < 0.05$ ).

Total amount of opioid analgesics (piritramid) during hospital stay was significantly lower in DAA group (19,5 mg v.s. 62 m,  $p = 0.0002$ ).

On radiographs, the DAA group had an average cup inclination of  $44.26^\circ \pm 4.45$  compared to an average cup inclination of  $46.71^\circ \pm 4.09$  in the AL group.

DAA group had 18 femoral stems undersized, 6 stems in AL group ( $p < 0.05$ ).

Higher risk of greater trochanter fracture was found in DAA group (9%).

Periarticular ossifications appeared in 4 patients in DAA group. 24 patients in AL group had periarticular ossification ( $p < 0.05$ ).

### Conclusion

In our study we experienced a fluent transition from AL to DAA approach in high volume surgeons.

DAA approach represents less painful and more tissue sparing surgical technique in comparison to AL approach.

## Total Hip Arthroplasty Outcomes in Patients with Concomitant Hip Septic Arthritis and Femoral Head Avascular Necrosis Following COVID-19: An Intermediate-term Follow-Up Study

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During COVID-19 pandemic, we observed some patients who developed concomitant hip septic arthritis (SA) and femoral head avascular necrosis (AVN) following COVID-19 infection. In this study, we aimed to report the intermediate-term results of two-stage total hip arthroplasty (THA) in these patients. In a case-series study, we evaluated nine patients (13 hips) with concomitant hip SA and AVN who underwent two-stage THA via direct anterior approach from 2020 to 2022. At the first stage, the head was removed with complete irrigation and debridement, and placement of antibiotic cement spacer in acetabulum. Antibiotic therapy was done empirically and then based on culture results. The second stage was done after normalization of ESR and CRP. Our main outcomes included Harris Hip Score (HHS) and complications. Data were collected from JRRC Hip Registry database. We had five unilateral and four bilateral hip involvements. The patients were 2 males and 7 females with a mean age of  $47.3 \pm 5.4$  years. On average, the symptoms started 43.2 days after COVID-19. The mean dose of received prednisolone for COVID-19 was 1636.1mg. Mean follow-up was  $2.5 \pm 0.7$  years. Culture results were negative in six patients, and positive in three patients (*Serratia*, *Staphylococcus epidermidis*, and *Salmonella*). One patient died due to leukemia. The mean HHS increased from 43.3 preoperatively to 82 postoperatively. We observed no cases of superficial or deep infection, component loosening, dislocation, or revision surgery. Two-stage THA seems a safe procedure in patients with concomitant post-COVID-19 hip SA and AVN with favorable functional outcomes in intermediate term.

## Accuracy of cup positioning in robot-assisted total hip arthroplasty using the Direct Superior Approach.

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Background: Robotic-assisted total hip arthroplasty (THA) has been introduced and accurate implant placement is expected.

The aim of this study was to compare the accuracy of Cup placement between the robot-assisted Direct Superior Approach (DSA) group and the non-robotic DSA group, measured using postoperative CT.

Subjects and methods.

The subjects were 46 patients with 46 joints who underwent robotic-assisted THA from May 2023 to August 2023 as group R and 46 patients with 46 joints who underwent THA by DSA without robot from August 2019 to August 2023 as group D. Patients were matched based on age, BMI and gender. The investigation method was CT imaging at 1 week postoperatively, and the angle of cup placement (anterior and lateral opening angles) was measured using 3D templating software. The evaluation items were cup placement angle, accuracy, precision, operative time and blood loss.

The mean forward opening angle was  $20.4 \pm 0.6^\circ$  for the R group and  $19.5 \pm 4.0^\circ$  for the D group. The mean outward opening angle was  $40.2 \pm 0.5^\circ$  for group R and  $37.9 \pm 3.6^\circ$  for group D. Both accuracy and precision were significantly higher in group R than in group D ( $P < 0.01$ ). The operating time and blood loss were  $72 \pm 15$  minutes and  $155 \pm 72$  g in the R group and  $74 \pm 12.5$  minutes and  $154 \pm 91$  g in the D group, with no significant differences.

Conclusion: The results of this study show that the use of Robot in DSA can



## Survival of Total Hip replacement in Sicklers

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**Aim :** The aim of this study was to assess the results of total hip arthroplasty (THA) performed on patients with sickle cell disease at our center and to compare these findings with outcomes in THA due to other causes. This investigation seeks to provide insights into survival of THA in sicklers. **Materials and Methods :** Ninety eight patients underwent a total of 117 THA for sickle cell disease. Among them, 76 patients had homozygous hemoglobin (Hgb SS) disease, while 16 had sickle cell trait (Hgb AS). This analysis included patients with Grade III Ficat and higher levels of avascular necrosis of the femoral head (ANFH), who received cementless porous-coated proximal femur fixation. Improvement was assessed using the Modified Harris Hip score, and pain levels were evaluated using the Visual Analog Scale **Results :** The VAS demonstrated improvement, with the average pre-operative score decreasing from 7 (ranging from 7 to 9) to 2.5 (ranging from 1 to 5). The mean pre-operative Modified Harris Hip Score was 44 (ranging from 32 to 63), which increased to 79 (ranging from 71 to 88) at the final follow-up, averaging 12.4 years (ranging from 4 to 18 years). **Complications** occurred in 17 patients (10%), with seven patients (5.9%) requiring revision surgery due to aseptic loosening. **Conclusion :** Based on our analysis, THA appears to be a safe option for individuals with sickle cell disease, even with an average follow-up period of 12 years. This suggests that surgery in younger patients ( $\leq 20$  years) with this condition is safe and shouldn't be postponed.

## Hip replacement through the modified anterior approach

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**Aim:** To present the modification of the anterior approach developed by us – without dissection of, and damage to the muscles, blood vessels and to the lateral cutaneous nerve of the thigh.

**Materials and methods:** The patient is positioned on the nonoperative side. A cutaneous incision is performed from a point located 2 cm distal and lateral to the anteroposterior spine of the ilium and parallel to the side band of the thigh. The stretcher of the side band is split along the fibers. Then retractors are positioned around of the femoral neck. The capsule is dissected. Further sawing and removal of the femoral head are performed. Next, the acetabulum is prepared and the cup is installed. For the treatment of the bone marrow canal, the lower limb is transferred to the position of extension, external rotation and adduction. The proximal femur is moved into the wound. The medullary canal is processed with rasps.

**Results :** 527 patients were operated with this surgical technique. Damage to the tensor fascia latae of the thigh was noted in 4%, while coagulation of the vessels encircling the femur was performed in 2%. Neuropathy of the lateral cutaneous nerve of the thigh was noted in 1%.

**Conclusion:** Our modified anterior access reduces the risk of damage to the lateral cutaneous nerve of the thigh, lateral vessels encircling the femur, and muscles of the hip joint area; pain syndrome decreases, which contributes to earlier activation of the patient.

## Vascular Complications in Revision Total Hip Arthroplasty: How to Avoid Them?

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**Introduction:** During revision total hip arthroplasty surgery, vascular complications are rare but must be constantly feared as they involve both the life of patient and the function prognosis of the limb. To avoid such complications, it is essential to conduct a thorough preoperative assessment of vascular anatomy and take appropriate preventive measures. **Case Report:** We present the case of a 48-year-old man with a surgical history of right total hip arthroplasty in 2017 and left total hip arthroplasty in 2018, who consulted for left hip pain evolving for 1 year with progressive worsening. Clinical examination revealed walking with assistance and pain on mobilization of the left hip. Pelvic X-ray showed a bipolar detachment of the prosthesis with protruding screws from the acetabular component into the pelvis. In view of this, surgical revision was decided. As part of the preoperative planning, a pelvic angio-CT scan was requested, showing a screw from the acetabular component with an endopelvic trajectory, brushing the inferior edge of the ipsilateral superior gluteal artery without contrast extravasation. To prevent a potentially life-threatening intraoperative vascular complication, embolization of the left superior gluteal artery was performed, and the patient underwent surgery without incidents. **Discussion and conclusion:** Vascular complications during hip prosthetic surgery are very rare, with an average frequency of 0.3%. In revision surgeries, the preoperative assessment should include, in addition to X-rays, an angio-CT scan to define the anatomical relationship between prosthetic components and vascular structures and precisely identify the therapeutic approach. Currently, preoperative embolization represents a significant advancement in preventing vascular complications by reducing blood flow in vessels adjacent to the surgical site.

## Features of total hip arthroplasty for nonunions of the femoral neck in elderly patients

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**Purpose:** improve the results of primary hip arthroplasty in elderly patients with pseudarthrosis of the femoral neck by developing and implementing improved diagnostic and treatment algorithms.

**Methods:** A monocenter cohort study was conducted on the results of treatment of 218 patients. The study consisted of a retrospective part (N=124) and a prospective part (n=94). All patients underwent conversion hip arthroplasty. The patients of the retrospective part were divided into 2 groups: group 1 (n=65) included patients in whom pseudarthrosis developed as a result of conservative treatment; in group 2 (n=59) – as a result of surgical treatment (various options of metal osteosynthesis). Based on the results, it is proposed to divide patients into “simple” and “complex” types of pseudarthrosis. A prospective part: the patients were also divided into 2 groups: 1st (n=51) – “simple” type; 2nd (n=43) – “complex” type .

**Results:** based on the results of the retrospective part, key risk factors for complications were identified: 1) presence/absence of metal structure migration 2) severity of local osteoporosis 3) degree of combined shortening (shortening of the lower limb + femoral offset). An algorithm has been developed for diagnostics and selection of the type of implants for the “complex” type: acetabular multi-hole component with mandatory fixation of the 3rd zone according to DeLee Charnley or double mobility cup cement fixation; The femoral component is non-modular conical with distal fixation. The proposed systematization and choice of implants made it possible to reduce complications by 11.9%; the number of revision interventions by 10.23%.

## The Efficacy and Clinical Significance of Subtrochanteric Osteotomy and Total Hip Arthroplasty for the Treatment of Crowe IV Type Hip Dysplasia

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Our study aims to explore the therapeutic effect and clinical significance of subtrochanteric osteotomy total hip arthroplasty for Crowe IV type hip dysplasia. Twenty patients with Crowe IV type hip dysplasia were selected. The osteotomy site was covered with an excised bone graft and fixed with steel wire. The corresponding length of femur was removed according to the preoperative plan, lower limb shortening, pelvic tilt, soft tissue, and sciatic nerve tension. Postoperative complications, improvement of hip joint function, and imaging changes of the hip joint site were evaluated. The surgical incisions all healed in stage I, without complications such as infection, sciatic nerve injury, and deep vein thrombosis. The Harris score increased from preoperative ( $42\pm 7$ ) points to postoperative ( $80\pm 5$ ) points, with an excellent and good rate of 87.8%. The average hip rotation center decreased by 47mm, and the average osteotomy shortening length was 35mm. All patients had bone healing at the osteotomy site, with an average healing time of 8 months. There was no significant loosening or dislocation of the prosthesis. The difference in bilateral limb length was ( $4.3\pm 1.5$ ) cm before surgery and ( $0.5\pm 0.3$ ) cm at the last follow-up, with statistical significance ( $P<0.05$ ). Subtrochanteric osteotomy and total hip arthroplasty can significantly improve hip function and limb imbalance, reduce Trendelenburg gait, increase bone healing rate at the osteotomy site, and reduce postoperative complications such as neurovascular injury. Its short-term efficacy is safe and reliable, and it is an effective surgical method for treating Crowe IV type hip dysplasia.

## Our experience in surgical management of peri-prosthetic hip fractures with NCB (Non-Contact Bridging) plating

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### Background :

The incidence of periprosthetic hip fractures have increased leading to more complex, expensive treatment with associated risks of systemic and local complications. There is a decisive role played by weakening of the bone resistance, osteoporosis , neurological disorders and increased risk of falling. We aimed at anatomical synthesis with a stable implant, essential to re-establish a good anatomical axis and early mobilization. The management represents a challenge with difficulty in obtaining good fixation due to the presence of a medullary system, presence of cement and a bone with a compromised quality.

### Methods:

We evaluated clinical and radiological results in patients treated in our department for periprosthetic hip fractures from 2021 to 2023. We included 12 patients of periprosthetic fractures regardless of their classification with a mean follow-up of 1.6 years. Over 60% of periprosthetic fractures were type B. We Exploited the ductility of the NCB plates, obtaining good stability of the fracture and of the prosthetic implant with only the aim of an early mobilization , absence of pain and return to activity. The analysis was performed using Harris Hip Score along with additional radiographic signs of loosening, infections or mechanical failure of the implants.

### Results & Conclusions :

There was no infection or mechanical failure in all patients treated. The Harris Hip Score significantly improved with a significant pain relief and all patients went back to their preoperative daily living activities.

## Simultaneous vs staged bilateral hip arthroplasty: monocentric analysis of satisfaction rate and complications.

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**Introduction:** Interest in bilateral total hip arthroplasty (THA) has been increasing over the past decade. This study aims to compare postoperative local and systemic complications, hospital readmissions, and satisfaction assessment in patients undergoing simultaneous versus staged bilateral THA. **Methods:** A retrospective observational study was conducted among patients who underwent simultaneous or staged bilateral THA between 2017 and 2020. Data on perioperative parameters, local and systemic complications, and 30-day hospital readmissions were collected. Patient satisfaction was assessed using Forgotten Joint Score (FJS). The comparison of continuous variables with normal distribution of variance was performed by ANOVA; for variables with abnormal distribution, the non-parametric test Mann-Whitney U was adopted. The distribution of dichotomous variables was analyzed by Chi-square test, and statistical significance was calculated by Fisher exact test. **Results:** The study included 199 patients, of whom 156 underwent staged and 43 simultaneous bilateral THA. A total of 44 patients developed complications (21 systemics, 12 locals, and 20 postoperative anemia). There were no significant differences regarding local (simultaneous 5% vs. staged 6%;  $p=.999$ ) or systemic complications (simultaneous 14% vs. staged 10%;  $p=.408$ ). Only the incidence of postoperative anemia was significantly higher in simultaneous group compared with staged group ( $p=.003$ ). There were no significant differences in FJS between the two groups ( $p=.258$ ). **Conclusion:** No differences in local or systemic complications nor readmission rates were observed following simultaneous or staged bilateral THA. Simultaneous bilateral THA is non-inferior to staged implants in terms of safety and patient satisfaction.

## Evaluating the risk factors for Lubinus SP II Femoral Stem Fractures: A Case Series of 5 Primary THA patients With a Mean Follow-up of 7.5 Years.

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**Background:** The reported rate of femoral stem fracture after total hip arthroplasty varies between less than 0.1 and 3.4%. The study aimed to evaluate the incidence of Lubinus SP II femoral stem fracture in our population and associated risk factors, and to examine clinical outcomes following revision THA for SP II stem fracture. **Methods:** 4244 primary THAs incorporating the anatomic femoral stem were identified within our institution from a prospectively compiled arthroplasty patient database. 5 patients presented with broken Lubinus SP II anatomical hip stem. Postoperative complications were recorded at each follow-up visit. **Results:** The incidence of stem fracture was 0.1% (5/4240) at a mean follow-up of 7.5 years. 3 were male, and 2 were female. The mean age was 63.8 years (range, 53-72; SD=7.4). The mean weight was 109 kg (range, 88-128; SD=14.2). The mean BMI was 36.5 (range, 32.5-41.0; SD=3.08). The mean time from primary THA to fracture was 6.4 years. The mean size of the cement restrictor (indirectly suggesting the femoral canal diameter) was 13.6 mm (range, 12-15; SD=1.1). The implant neck angle used was 117 in 4 patients and 126 in 1 patient. The mean stem position in varus was -2.2 (range, -6- 0; SD=3.0). 4 fractures (80%) occurred at mid-stem and 1 (20%) distally with -6 degrees varus and a 15 mm cement restrictor. **Conclusion:** To minimize stem fracture risk, we recommend using as large a size stem as possible after sequential reaming in tight femoral canals and avoiding stem downsizing along with holistic postoperative management.



## Associations between weight loss pre-hip or pre-knee arthroplasty and peri- and post-operative outcomes.

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**Background:** Obesity is associated with increased complications after arthroplasty. However, it is unknown whether these risks are mitigated by pre-operative weight loss. Our systematic review and meta-analysis explores the association between pre-arthroplasty weight loss and peri- and post-operative outcomes. **Methods:** We searched medical databases and grey literature for studies of hip/knee arthroplasty patients who underwent medical and/or surgical weight loss prior to surgery. Exclusion criteria included articles pre-2010, case studies, upper limb or revision arthroplasty, and articles not published in English. Outcome measures included incidence of wound infection, pulmonary embolus, deep vein thrombosis (DVT) and revision surgery up to 90 days post-arthroplasty. The intervention group included patients living with obesity who lost weight pre-arthroplasty. The control group consisted of patients of any BMI who underwent arthroplasty without intervention. **Results:** We included 21 articles, with 50,672 patients in the intervention group and 1,446,755 patients in the control group. Pre-arthroplasty weight loss was associated with an increased risk of revision surgery (Odds Ratio (OR) 1.32,  $p=0.0004$ ) and DVT (OR 1.37,  $p=0.00001$ ). However, there was no association between pre-arthroplasty weight loss and superficial wound infection (OR 1.08,  $p=0.54$ ), deep wound infection (OR 0.97,  $p=0.79$ ) or pulmonary embolism (OR 0.93,  $p=0.38$ ). **Conclusion:** These data suggest that weight loss prior to arthroplasty does not reduce the risk of perioperative complications and may increase the risk of DVT and revision surgery. However, well-designed and adequately powered prospective studies are required to establish the risks and benefits of pre-arthroplasty weight loss in people living with obesity.

Post Acetabular fractures with nonunion and instability converted to THR. Are they different from healed acetabular fractures with secondary arthritis? A comparative study.

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Failed or neglected acetabular fractures with instability and bone loss pose reconstructive challenge. 121 patients underwent THA for post-traumatic arthritis due to acetabular fractures between 2009 and 2019. 36 hips with nonunion and instability (Group A) and 85 with healed fractures with post traumatic instability (Group B) were studied. Two staged surgery was done in 10 patients in each group due to suspected infection. Group A patients had longer duration of surgery (p 0.06) and more bone loss (p<0.001). Fixation used was uncemented in 87(71.9%), cemented 10 (8.26%), hybrid THA in 7(5.78%) and reverse Hybrid THA in 17(14.04%) patients. In group A bone defect was managed with femoral head (3), tri-cortical iliac crest graft (1), posterior column plating(3), tantalum wedge augment (5), column buttress(1), Muller ring (2) and Burch-Schneider cage in 2 hips. There was no significant difference between the two groups in terms of acetabular inclination (p 0.7), horizontal offset (p 0.19), restoration of the center of rotation (p 0.148) and Oxford Hip Score (p = 0.16). There was better restoration of vertical offset in Group B (p 0.039). Mean follow-up was 5.3 year ( 2 yrs - 11 yrs). Complications include postoperative dislocation(1), heterotrophic ossification(10 in each group), revisions (1 septic & 1 aseptic loosening) and 3 cemented cups have radiological loosening awaiting revision. Cups survival rate was 100% for uncemented and 74% for cemented cups. In spite of larger bone defects that require more reconstructive options outcome is excellent after THA in both in instability and arthritis groups.

## Acetabular protrusion of the hip cup in elderly patients - to treat or not

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Introducing: Elderly patients present a specific subgroup of patients when it comes to treating acetabular protrusion of the acetabular cup of a total hip prosthesis. Except for the poor bone stock, limited availability and the poor bone quality, the general health status and the mental status are of very good relevance to the surgery outcomes. In our study 17 elderly patients are included, all aged 90 years plus, They have all suffered protrusion of the acetabular cup- seven were operated and 10 were not operated. The mortality within a year of diagnosis was followed up, quality of life was measured, Harris hip score used as a measure of the results.

The result of the study suggests that in mentally fit patients surgical treatment always warrants good results. Our recommendation is to always properly assess the patient and if his mental status allows, consent should be obtained from the patient himself, then the surgical treatment should be considered always as an option. This has not only prolongs patients quality of life but adds life to his years. Technique: revision of the acetabular component was the surgical strategy with implantation of a retainer cage with a cemented hip cup, in a proper version with good filling of the voids with bone graft. Conclusion: Even if challenging, such procedure should always be considered in elderly patients who are mentally fit to consent for themselves and the results is satisfaction for both the patient his family and the surgeon himself.

## Is open reduction and internal fixation an option for the management of Vancouver B2 periprosthetic Hip fractures?

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### Introduction

Increasing number of hip arthroplasties with an aging population has led to a growing burden of periprosthetic hip fractures. Fractures around stem leading to loosening with good bone stock are classified as Vancouver B2. Operative management was traditionally long stem revision arthroplasty. We aimed to determine if ORIF is a safe and effective method of managing these fractures in frail older patients.

### Method

We reviewed all periprosthetic hip fracture cases managed with ORIF at our institution. Data included patient demographics, ASA grading, physical status, perioperative care, surgical management and recovery. Primary outcome was revision. Secondary outcomes were surgical time, complications, time to mobilization, LOS, time to union, and Oxford Hip Score.

### Results:

15 patients were included, 4 men and 11 women, mean age 84 (SD 8.2). The ASA was III in 12 cases, II in 1 case, and IV in 2 cases. ORIF was performed by one of three fellowship-trained consultant hip surgeons using the DePuy Synthes VA LCP™ PPF Plating System. Mean follow-up was 10.1 months (SD 6.4).

The mean operative time was 118 minutes (SD 32 min), and the mean length of stay was 24 days (SD 23 days). No inpatient mortality cases. 1 case of wound infection. 2 patients died during follow-up. Mean time to mobilization was 3.9 days (SD 3.1). No revisions or reoperations. Mean Oxford Hip Score at the most recent follow-up was 30.5 (SD 8.3).

### Conclusion

ORIF is a viable option for the management of frail older patients with Vancouver B2 periprosthetic fractures.

## Case Report: Modified Harrington Reconstruction For Periacetabular Metastatic Destruction

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There has been an increase number of patients with bone metastatic disease and pathological fractures due to the medical advances in cancer treatment which prolonged the survival of cancer patients.

Modified Harrington reconstruction of periacetabular metastatic disease combined with hip arthroplasty is one of the options for patients with pathological fractures in order to establish stability, enabling early, full weight-bearing mobility, and pain relief.

It consists in reinforcing the acetabulum with two groups of threaded pins that converge in the supra-acetabular region. The pins are cemented together with an acetabular support ring and a THR. This technique was further modified by using a third pin. This forms a scaffold onto which cement can be applied and where an acetabular component of a THR can be cemented.

A 47-year-old patient followed up in primary healthcare for complaints of pain in the left lower limb since January 2019.

He was diagnosed with stage IV high-grade infiltrating lung adenocarcinoma with iliac bone and dural metastatic involvement.

On July 2019, the patient had a subtrochanteric fracture of the left femur and underwent the modified Harrington procedure.

In the post-operative period, the patient's progress was positive, and he was able to walk with full weight-bearing with a walker at the time of discharge.

It seems that modified Harrington's procedure can be used for all Harrington class defects and it seems to have low complication rate. For that reason, we opted for this technique, since it is described to be reproducible, safe and cost-effective.

## Thigh Compartment Syndrome After Primary Hip Arthroplasty

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**Background:** Thigh compartment syndrome (TCS) is a rare and serious complication of hip arthroplasty surgery. Watchful post-operative follow-up is essential for the early identification of the signs and symptoms associated with this problem. Fasciotomy of all compartments of the thigh is usually the standard treatment for this entity. **Case Presentation:** A 70-year-old male patient with left hip osteoarthritis was submitted to a primary total uncemented hip arthroplasty. After a 5-day hospitalization period, the patient was discharged with partial weight bearing with crutches allowed and prophylactic enoxaparin. He was readmitted three days later due to suspected deep vein thrombosis of the operated limb. Clinically, he presented pain and marked edema of the left thigh, as well as paresthesias of the leg and foot. Angio-CT revealed a large contained hematoma of the iliopsoas and vastus lateralis, so a compartment syndrome of the thigh due to an expanding hematoma was assumed. The patient underwent fasciotomy of the anterior compartment, confirming the suspected diagnosis. **Clinical Outcomes:** The days following the procedure elapsed without complications. Doppler ultrasound and CT scan performed on the second and ninth day after surgery confirmed complete resolution of the condition. **Discussion:** Few cases of TCS are described in the literature, most of which are associated with anticoagulant therapies. As the thigh rarely presents with compartment syndrome, the clinical evaluation proved to be invaluable in the diagnosis of this pathology. In conclusion, though uncommon, TCS is a complication to be considered in the postoperative context of total hip arthroplasty.

## Legg-Calve-Perthes Disease – A New Dimension of Treatment

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**Introduction:** Perthes disease is a rare childhood condition affecting the hip joint. Prevalence is one in 10,000 children between 3 to 11 years old. It develops due to temporary loss of blood supply to the femoral head, causing bone cells to die. This process is called osteonecrosis/avascular necrosis. As a consequence, the femoral head is weakened, leading to multiple fractures. When the blood supply returns, a new femoral head forms. Both hips are affected in up to 15% of children. Treatments include time/observation, drugs, physical therapy, casting and surgery. Duration of recovery is much longer. In our study, restoration of the vascular supply, reformation of femoral head was achieved by application of PRP (Platelet Rich Plasma) within 6 months of starting the treatment.

**Aim:** To observe the role of autologous PRP in Perthes disease.

**Method:** 30-40 ml blood is drawn from the cubital vein and centrifuged to collect PRP. In PRP, platelet is 2.5 times more concentrated than blood. In our protocol, 3-5 doses of PRP injection is given directly into the hip joint. Follow up X-ray is done after one month of third injection. After checking the X-ray, decision is made whether to give further two doses of injection or not.

**Result:** Among 10 patients, all were benefited regarding pain. 8 patients were cured from pain and radiological evidence showed reformation of the femoral head.

**Conclusion:** Though our sample is small, this regenerative treatment with PRP injection therapy arises the hope to cure a neglected disease like Legg-Calve-Perthes disease.

## The Distribution of Caput-collum-diaphyseal Angle in the Iranian Elderly Population: Implications for Proximal Femoral Nail Design

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Proximal femoral nails (PFNs) are widely used in the surgical management of unstable proximal femur fractures. These implants are designed with fixed femoral neck-shaft angles in different sizes according to anthropometric studies in the Western population. In this study, we aimed to evaluate the Caput-collum-diaphyseal (CCD) angle in the Iranian population and investigate if any design modification for PFNs is needed for the Iranian population. In this retrospective study, we evaluated patients with hip and pelvic radiographs who visited our hospital between 2015 and 2023. The CCD angles were measured on AP pelvic and hip radiographs. Also, correlation analysis was conducted to evaluate the CCD angle in different age groups. The CCD angle of 1040 patients with a median age of 72 (ranging from 60 to 99) was evaluated in this study. The mean CCD angle of the Iranian population was  $130.6 \pm 5.9$  (range from 115.4 to 149). It was found that 117 (11.3%) of the patients had Coxa Vara (CCD<120) or Coxa Valga (CCD>140). The CCD angles were not significantly different between men and women. The findings of this study demonstrated that the mean CCD angle of the Iranian population was relatively higher than in Western countries ( $\sim 127^\circ$ ). Common PFN designs (with CCD angles of 125, 130, and 135°), considering a range of  $\pm 5^\circ$ , cannot cover around 11.3% of proximal femurs in this area. Therefore, a proportion (nearly one-tenth) of PFN productions should be allocated to <120 and >140 CCD angles.



## Results Of Surgical Decompression Of The Lateral Femoral Cutaneous Nerve Of Thigh In The Management of refractory Meralgia Paresthetica.

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### Objectives:

The objective of our study was to evaluate the outcome of surgical decompression along with neurolysis of the LFCN (Lateral Femoral Cutaneous Nerve) for patients who had intractable LFCN neuropathy not resolving with conservative measures.

### Study Design & Methods:

A retrospective cohort consisting of 19 patients with a mean age of 54.2 years (38 – 64 years) who underwent decompression was identified. The mean duration of painful symptoms was 8.9 months (6.4 - 11.2 months). We systematically evaluated the postoperative course by an independent surgeon and follow-up examinations within a standardized protocol. Patients were evaluated on the basis of pain using an NRS (numeric rating scale), temperature hypersensitivity, numbness in the LFCN region, and overall patient satisfaction compared to the presurgical parameters. The mean follow-up was 15.2 months.

### Results:

There was a dramatic reduction of pain from 8.2 in the preoperative phase to a mean of 1.4 in the postoperative period on NRS scale (Scale 0 – No pain – 10 – Worst possible pain). All patients reported pain relief and preservation of sensations. 17 patients (89.47%) reported complete satisfaction and relief of symptoms, while 2 patients (10.53%) reported partial satisfaction but good relief of pain.

### Conclusions:

Surgical decompression and neurolysis of LFCN is a simple, effective, and straightforward procedure which is reproducible by most surgeons. Most patients get complete relief of unpleasant pain and the sensations recover considerably. Our findings suggest that decompression and neurolysis should be used as the surgical procedure of choice for refractory Meralgia Parasthetica.

## Avascular necrosis of the femoral head: a sequela of covid 19

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**Objective:** Avascular necrosis of the femoral head (AVN) is a condition that causes significant morbidity and impairment of the hip. While many questions remain about COVID-19, numerous studies and reports have shown a profound prothrombotic state at both the microvascular and macrovascular levels in people with recent infections. However, there is limited information on whether COVID-19 acts as a catalyst for the development of avascular necrosis. The aim of this research is to correlate AVN as a sequela of COVID-19. **Materials and Methods:** The study included a total of 35 patients aged between 26 and 73 years. Twenty-three of them were male and twelve were female. Thirty patients (85.7%) reported having received steroids by injection and/or orally as part of a treatment plan, while the remaining 5 patients (14.3%) never received steroids for any pathology. Among these 30 patients, 25 of them (83.3% of the sample) reported having received steroids only as part of a protocol for COVID-19 treatment, while 5 of them (16.7%) had previously used steroids for the treatment of other conditions. **Discussion:** Since the pandemic began, many medications, including corticosteroids, have been studied for their efficacy against COVID-19. While corticosteroids save lives in the treatment of COVID-19, they also present a risk factor for the development of AVN. **Conclusions:** The use of steroids during COVID-19 treatment, particularly at high doses, represents a clear risk factor for AVN. This study demonstrates how it correlates as the main triggering cause for the disease in recent years.

## Preoperative Deep Vein Thrombosis in Elderly Patients with Hip Fractures: The Risk and Prevalence

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Hip fractures are common in the elderly population after a fall causing a high risk of developing complications such as venous thromboembolism which may cause significant morbidity and mortality. To date, there is no local data regarding the prevalence and risk of DVT before surgery in elderly patients with hip fractures. This study aimed to establish the prevalence of DVT in elderly patients following a hip fracture and evaluate the risk factors for the occurrence of preoperative DVT in this population. It is a retrospective cross-sectional study involving 118 patients with a history of hip fractures in Hospital USM from January 2014 to November 2020. The patient screening was conducted via the PACS (Picture Archiving and Communication Systems) system and medical records. Patients with hip fractures and had an ultrasound Doppler of the lower limb one day before surgery were selected. All selected risk factors, including demographic data information, were recorded in a study proforma. Data were entered in Microsoft Excel and analyzed using SPSS version 26.0. The overall prevalence of preoperative deep vein thrombosis in elderly patients with hip fractures was 5.4 %. The mean duration of immobilization in DVT patients is 18.4 days. None of them received Enoxaparin as prophylaxis. Two out of five DVT patients had underlying malignancy. Prevalence for developing VTE in the elderly with hip fractures ranged from 9-12.7%, with the majority occurring postoperatively. The critical risk factors for DVT development were the duration of immobilization, types of DVT, prescribed prophylaxis, and malignancy.

## The use of the modified false-profile views to evaluate hip deformities preoperatively and to direct planning of treatment: a case series study

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**Objective:** The false-profile (FP) view is widely used in the evaluation of hip pathologic conditions. The sagittal view of femur and oblique view of acetabulum can be evaluated in FP. However, the relative position between femur and acetabulum is unitary in the standard protocol. More information could be revealed by adjusting the hip flexion during radiation exposure. The aim of this case series study is to investigate the feasibility of modified FP view in the assessment and planning of hip deformities. **Method:** 9 cases of hip deformities (7 cases of avascular necrosis (AVN) of femoral head and improper congruity, 1 case of slipped capital femoral epiphysis (SCFE), 1 case of anterior subluxation in neuromuscular disease) were evaluated by modified FP view. These views were obtained in different extents of hip flexion, include 0, 30, 45, 60, 90 degrees or the maximum of hip flexion. The congruity was assessed. **Result:** In the case of hip anterior subluxation, the hip was reduced in 25 degrees of flexion in the base of traditional FP view. In the case of SCFE, the hip was flexed in maximum and the femoral acetabular impingement site was revealed. In the AVN patients, improved congruity was observed in case depended hip flexion. Surgical correction in sagittal plane was predicted in these modified FP views. **Conclusion:** All these modified FP views could be used as a director of planning of treatment. The goal of surgical treatment in these cases could be predicted by preoperative mimicking.

## Arthroplasty revision for offset defect

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Introduction :It is no secret that restoring the native offset value is essential for the proper functioning of a hip prosthesis.

Material and method :First of all we will present clinical cases presenting an offset defect with analytical study of the radiographs and the resulting symptomatology.. but also the cases taken up for revision.Results :

The result was evaluated clinically by the Merle d'Aubigné Postel

score.discussion: always important to prevent and plane our arthroplasty before the surgical act to avoid what can be a no return mistake . Conclusion:

Variations in offset directly influence the angle of attack of the gluteus medius. For several authors, increasing it serves to tighten the soft parts but unfortunately there are only a few studies on the subject, yet it is becoming a necessity. On this our take home message is: do the pre-study - offset op a priority before any hip arthroplasty.

## An uncommon case report: Pathologic fracture in a proximal Femur aneurysmal bone cyst in a child

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Aneurysmal bone cysts are a group of benign, expansile, locally aggressive lesion characterized by fluid filled cyst usually in the metaphyseal end of long bones. They usually affect children and young adults; with an atypical etiology and uncommon presentation. Treatment modalities include en bloc resection and curettage with or without bone graft or bone substitute augmentation with instrumentation, sclerosing agents, arterial embolization and adjuvant radiotherapy. We report a rare case of ABC with pathological fracture in the proximal femur of a 13 year old male patient, who presented to the emergency department with severe pain in the right hip and inability to walk following trivial fall while playing. Curettage with open biopsy was performed followed by implantation with modified hydroxyapatite granules and internal fixation for the subtrochanteric fracture with paediatric Dynamic hip screw and four hole plate, with a favourable Outcome. There is a lack of a standard guideline for management on account of uniqueness of these cases; curettage with bone graft or bone substitutes in conjunction with internal fixation of associated pathologic fracture yields bony union with adequate clinical results.

## Endoscopic iliopsoas tenotomy for iliopsoas tendinitis post-hip arthroplasty

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**Aim:** The aim of this study was to present our experience with endoscopic release of the iliopsoas (IP) tendon at the lesser trochanter as a therapeutic approach for painful IP tendinitis following total hip arthroplasty (THA). **Method:** Anterior hip pain is a commonly encountered complication post-THA, which can be exacerbated by activities such as straight leg elevation and hip flexion during ambulation. This pain may result from a protruding, sharp-edged acetabular cup or residual anterior acetabular osteophytes. The conventional invasive solution was open revision surgery involving cup exchange, repositioning, and debridement of the acetabular rim, possibly coupled with IP tenotomy. In our orthopedic department, we have developed a treatment protocol that combines clinical and radiographic evaluation and then a minor endoscopic procedure with release of the IP tendon insertion at the lesser trochanter. Over the past 8 years, we have applied this technique to 44 patients. **Results:** Statistical analyses utilizing paired t-tests revealed a significant improvement in iHOT-12 scores ( $p < 0.001$ ) and VAS scores ( $p < 0.001$ ) post-operatively. There was a mean increase of 33.59 points in iHOT-12 scores after IP release, indicating a notable enhancement in hip-related quality of life. VAS scores exhibited an average reduction of 5.03 points post-surgery. **Conclusions:** Overall, the results suggest that endoscopic release of the IP tendon is an effective treatment for improving hip-related quality of life and reducing pain levels in patients suffering from IP tendinitis subsequent to hip arthroplasty.

## Use of 3D printed Patient Specific Cutting and Alignment Jigs in Periacetabular Osteotomy

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Hip dysplasia can cause early-onset osteoarthritis amongst young adults. Periacetabular osteotomy (PAO) corrects the acetabular dysplasia while preserving the joint. 3D-printing technology has been beneficial in creating patient-specific models for surgical planning, implants and jigs.

We aim to utilize the advantages of 3D-printed patient-specific cutting and alignment jigs to improve the safety and precision of correction in PAOs.

This case study is a 36-year-old female with persistent right hip pain. XR and MRI revealed acetabular dysplasia. CT pelvis was utilized to create a 3D-printed model of her pelvis and corresponding cutting and alignment jigs. The ischial osteotomy was performed under image-intensifier guidance and the pubic osteotomy was done under direct vision. Supraacetabular and retroacetabular osteotomies were performed using the 3D-printed cutting jig which was fixed with K-wires. A Schanz pin was applied to the acetabular region and the 3D-printed alignment jig was fixed with K-wires. The acetabular segment was then mobilized per the alignment jig to achieve the precise pre-calculated correction of the acetabular coverage. The procedure was completed with fixation of the osteotomized acetabular aspect with screws. (Figure 3) .

Postoperatively, the patient was allowed toe-touch weight bearing over the first 2 weeks with progressive weightbearing. At 3 months post-op, the patient could ambulate full weightbearing without aid and with minimal pain.

There is currently no published literature of the usage of patient-specific jigs for PAO. Using patient-specific jigs allow for reduced operative time and blood loss, improved osteotomy precision, and increased accuracy in correction of the acetabular coverage.



## Femoral head reduction osteotomy in severe hip deformities

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**Introduction:** Sequelae deformities in the pediatric hip ultimately result in a dysmorphic femoral head that induces secondary acetabular dysplasia, progressive deterioration of function and early joint degeneration. The technique of cephalic reduction osteotomy (FHRO) allows reduction in size, using the healthy lateral portion of the femoral head, to improve sphericity, containment and potentially improve function by decreasing hip pain. The objective is to describe the technique and report the clinical and radiological results of our series. **Methods:** A retrospective study of 6 patients with hip pain, severe deformity with intact peripheral cartilage and central necrotic zone. Patients with significant osteoarthritis and/or severe non-reconstructable deformity were excluded. We quantified hip pain and function using the Harris Hip Score (HHS). Radiographic measurement of lateral medial edge angle, extrusion index, Tonnis angle, head size percentage and sphericity index were performed. **Results:** Six patients were evaluated with a mean follow-up of 3.75 years. The mean age was 14 years. Periacetabular osteotomy was performed in 3 patients. HHS improved significantly from a preoperative 62 to a postoperative 85. No patient developed complete avascular necrosis or procedure-associated infections. **Conclusion:** HROF, with or without pelvic osteotomy, is a salvage procedure to preserve the native hip in patients with sequelated, dysmorphic, and painful femoral head. It requires training in the technique of surgical dislocation of the hip and is an available option in hips historically considered non-reconstructable.

## Development of a 3D Planner for Personalized Periacetabular Osteotomy

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**Introduction:** Bernese periacetabular osteotomy (PAO) aims to improve femoral head coverage (FHC) in hip dysplasia. The MSk Lab Hip 3D Planner (MSkL-HP) simulates PAO using 3D software. It provides more precise native anatomical parameters, optimising lateral centre-edge angle (LCEA), Tönnis angle and FHC. We evaluated how adjusting location and orientation of PAO cutting planes can alter FHC whilst minimising acetabular fragment collision with the pelvis. **Method:** We simulated 80 PAOs on one dysplastic hip. Posterior column and ischial cuts were standardised, whilst iliac and pubic cut combinations varied. Iliac cut slope was either neutral, or 5mm above/below anterior entry point. Pubic cut angle was either neutral, 50° or 70°. Iliac and pubic cuts were simulated at 0, 5 and 15mm – distal/medial – respective to a classic cut. We recorded fragment adjustment (translation and rotation) and % bone overlap. Targets were LCEA >30°, Tönnis angle <10°, and FHC >70%. **Results:** Pre-operative LCEA, Tönnis and FHC were 27.8°, 14.1° and 64.4% respectively. Across all PAOs, the median improvement in LCEA, Tönnis and FHC were 8.8° (range 6.7-10.1°), 9° (range 7-10.5°) and 9.7% (range 7.6-11%) respectively. Iliac cuts using exit points 5mm above or 5mm below the anterior entry point and pubic cuts at 50° and 70° were associated with the greatest improvement in parameters. **Conclusion:** MSkL-HP feasibly and reliably planned personalised PAO, measuring pre-operative and simulated post-operative objective metrics. Patient-specific pubic and iliac cuts enable greater correction while maximising bone overlap. Further simulations on varying morphologies may improve standard techniques.

## A Novel 3D Method of Femoral Torsion Measurement Provides Anatomical Estimations for Osteotomy

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**Background:** Abnormal femoral torsion is a cause of femoroacetabular impingement (FAI) and can be treated using derotational femoral osteotomy (DFO). Femoral torsion also influences the outcomes of arthroscopic surgery for FAI and periacetabular osteotomy. Femoral torsion is routinely measured in 2D using CT, and there are a number of proposed techniques. All however simplify a complex 3D pathomorphology. We propose a novel 3D anatomical (MSkLab) method and compare it to existing techniques. **Methods:** Twenty patients' 3D CT femur models were landmarked and segmented. Murphy's and Reikeras' 2D measurements were carried out using CT scans and were compared to the McBryde and MSkLab 3D methods. Both 3D methods calculated the centre point of individual neck CT slices to plot a neck axis of 'centroids'. The MSkLab method differentiates itself by determining the shaft axis using centroids down the entirety of the femur. **Results:** Means were as follows, Murphy: 15.1° (SD 9.5 range 3.6-36.6), Reikeras: 12.6° (SD 9.3 -4 -30), McBryde: 18.5° (SD 9.3 range 0.5-29.7), MSkLab: 20.2° (SD 9.2 range 1.2-35.6). A repeated measures ANOVA gave a  $p=0.052$  between all measurements. An unpaired t test comparing 2D and 3D demonstrated  $p=0.0083$ . **Conclusion:** 2D methods may underestimate femoral torsion as they simplify the femoral neck to two discrete points. 3D methods are affected by cam morphology and osteophytes. An accurate anatomic measurement is key to correcting femoral maltorsion, but care should be taken in the interpretation of 3D measurements for patients undergoing arthroplasty.

the treatment of trochanteric fractures in subjects over 75 years of age our results of 185 hips operate from january 2022 to may 2023

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Our primary objective was to assess whether different types of surgical interventions have an effect on mortality in elderly patients with fracture of the trochanteric massif . A secondary was to examine factors related to mortality in our patient.

Patients aged 75 years and older who have a fracture of the trochanteric region and who have undergone surgery with one of the following two fixation methods (endo and extramedullary) were evaluated retrospectively. Effects on mortality were examined for factors such as type of anesthesia, ASA score, wait time for surgery, and length of hospital stay

185 patients: 115 patients were women and 70 were men operated from January 2022 to June 2023. The mortality rate after the first year was found to be 30%. Patients over 80 years of age had higher mortality rates than younger patients (75-85 years).

The risk of mortality was found to be higher with extramedullary fixation than with endomedullary fixation. The longer the preoperative period, the higher the mortality, not to mention that the type of fracture plays a role in the mortality rate from the age of 75 years

Age and co-morbidity factors and the type of fracture fixation material are all risk factors for mortality in the first year. Our experience has allowed us to conclude that rapid surgical management within 24 hours reduces the risk of mortality as well as the right choice of osteosynthesis equipment allowing the patient to stand up quickly (Gamma nail), without forgetting the importance of preventing osteopenia

## Surgical treatment of femoral head fracture-dislocations: About 13 Cases

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### Introduction:

Femoral head fracture is a rare injury complicating traumatic dislocations of the hip joint in 6 to 15% of cases. There is no established consensus for the diagnosis and treatment of traumatic femoral head fracture dislocations, mainly due to the rarity of this injury. The aim of our study is to investigate the injury mechanism, the type of surgical treatment, and the functional prognosis of surgical treatment in this rare and sparsely described condition in the literature.

### Methods:

This is a retrospective study, we report a series of 13 cases, all men presented a hip dislocation associated with a femoral head fracture treated surgically between 2017 and 2022. Functional recovery was assessed using the modified Merle d'Aubigné and Postel score. The results were evaluated by the Thompson and Epstein score.

### Results:

Four cases presented with a Pipkin type I fracture, 03 cases of type II, and 06 cases of type IV. The longest follow-up was five years, with an average of 18 months. No infections were noted in our case study, 02 cases of aseptic necrosis of the femoral head were reported, and 3 patients had heterotopic ossifications.

We obtained 31% excellent results, 23% good results, 31% fair results, and 15% poor results.

### Discussion-conclusion:

Treatment principles include urgent anatomical reduction, restoration of hip stability, and removal of intra-articular fragments. However, given the rarity of the injury, it is difficult to determine precise therapeutic recommendations for all types.

## Hip Fracture - Dislocation with Displacement of the Femoral Head in the Scarpa's Triangle

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Introduction: the most frequent type of hip dislocation is anterior or posterior, with or without an associated fracture. Hip fracture/dislocation without fracture of the wall of the acetabulum is a rare entity. Aim: we report an infrequent hip dislocation with anteromedial dislocation of the femoral head in the Scarpa's triangle and adjacent neurovascular structure involvement. Material- Method: a 44-year-old man was referred to our institute after a traffic accident with pain in his right hip. Radiographic control revealed hip fracture dislocation with the femoral head in an extra-articular position. The femoral head penetrated the articular hip joint and was dislocated without an associated acetabular injury. A pelvis CT scan, performed to rule out intra-articular fracture and to further evaluate the malposition of the femoral head, revealed that the fractured femoral head was positioned between the pectineus muscle and the adductor magnus. A closed reduction was first performed, but it resulted ineffectively. Successively open exploration of the hip joint was done using Hardinge's approach. The femoral head was gently retracted with a long Kocher instrument through that space. An uncemented hip hemiarthroplasty was used because a total hip arthroplasty was not available at that time. Results: the patient's recovery after surgery was uncomplicated, and functional outcomes and follow-up controls were satisfactory. Conclusion: post-traumatic hip fracture/dislocation is a surgical emergency due to the femoral vessel and nerve involvement. Immediate treatment is necessary for this uncommon case to avoid potentially devastating complications.

## The treatment tactic of femur gunshot fractures in different periods of medical evacuation

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**Introduction.** Gunshot fractures treatment of the femur is actual nowadays because of large number of complications and high rates of disability after these injuries, moreover this situation requires special diagnostic and treatment. **Material and methods.** It was carried out the analysis of 57 clinical cases with a gunshot fracture of the femur from 2022 to 2024. Fracture of the proximal part of the femur was verified in 11.1% of observations, diaphyseal fracture - in 68.5%, fracture of the distal - in 20.4%. According to the classification of R. B. Gustillo, J. T. Anderson, fractures of II degree were observed in 22.2% of cases, IIIA degree - in 53.7%, IIIB degree - in 14.8%, IIIC degree - in 9.2%. **Research results.** For all gunshot fracture was provided basic assistance level for medical evacuation (level I - 12.3%, level II - 71.9%, level III - 61.4%, level IV - 96.5%). In 57 patients were performed 147 surgical interventions. All cases underwent fasciotomy, primary and repeated surgical processing. Starting from the II level of medical care, 40 external fixation devices were applied (86% of the wounded). Autovenous arterial prosthetics was performed in 10.5%, classical external osteosynthesis (OS) - in 8.8%; OS with Ilizarov apparatus - in 5.3%. Internal OS – in 65%. In long-term period nervous disorders were observed in 33.4%, contractures - in 36.9%, delayed consolidation - in 5.3%. Fatality rate - 1.7%. **Conclusions.** Treatment of gunshot femur fracture showed good (47.3%) and satisfactory (40.3%) functional outcomes in 12 months after injury.

## Precision Surgery for Femoral Neck Fractures: Strategies for Choosing the Best Treatment

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Femoral neck fractures, common in the elderly, occur at the proximal end of the femur and pose significant health risks. Prompt medical attention is critical because these fractures can lead to immobility, pain, and even death, especially in older adults. Surgery is often necessary. Precision surgery for femoral neck fractures involves precise planning and tailored treatment approaches to achieve optimal patient outcomes. When choosing the best treatment strategy, several key factors must be considered. The patient's age, overall health status, comorbidities, and functional requirements play a key role in determining the most appropriate surgical intervention. Younger, active patients may benefit from procedures aimed at preserving the native hip joint, such as internal fixation with screws or pins, to maintain mobility and reduce the risk of complications associated with hip replacement surgery. Conversely, older patients with poor bone quality and limited mobility may require more invasive procedures, such as hip arthroplasty, to restore function and relieve pain. Furthermore, the presence of associated injuries or deformities, such as osteoporosis or hip dysplasia, may require additional surgical considerations to optimize results and minimize the risk of complications. The purpose of this study is to present the treatment approach for patients with femoral neck fractures treated at our institution using multiple case reports.



## Clinical Outcomes of Primary Cementless Bipolar Hemiarthroplasty for Unstable Intertrochanteric Fractures: A Retrospective Study

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In our aging society, intertrochanteric fractures pose significant mortality and morbidity risks among elderly individuals with comorbidities. Current standard treatment, surgical fixation, takes time until full union, delays patient mobilization, and may be associated with mechanical failure and need for revision surgeries. Primary bipolar hemiarthroplasty (BHA) is associated with early recovery, immediate pain relief and mobilization. In this study, we aimed to evaluate the clinical outcomes of primary cementless BHA for unstable intertrochanteric fractures (UITF). This study was conducted on patients admitted to the Imam Khomeini Hospital Complex between January 2021-2023. Patients more than 65 years with UITF who underwent cementless BHA were included from JRRC Hip registry database. Our main outcomes included Harris Hip Score (HHS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Visual Analog Scale (VAS), and complications. Statistical analysis was performed using SPSS 26. We had 17 male and 25 female patients, with a mean age of  $70.6 \pm 8.4$  years. The mean follow-up time was 19.8 months. The overall mortality rate was 30.9% (13 patients); however, we had no mortality during the early postoperative three-month period. The average HHS increased from 40.0 preoperatively to 89.4 at the final follow-up ( $p < 0.01$ ). The average VAS increased from 8.6 preoperatively to 2.1 at the final follow-up ( $p < 0.01$ ). The mean pre- and postoperative WOMAC scores were 62.6 and 24.2, respectively ( $p < 0.01$ ). We had no cases of dislocation, loosening, periprosthetic joint infection, and fracture. Primary cementless BHA seems a viable option in UITF with favorable clinical outcomes and low rate of complications.

## Pure obturator dislocation of the hip: a case report following a traffic accident

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Traumatic anterior dislocation of the hip without fracture of the acetabulum or femoral head is rare. We report 1 case of obturator dislocation (anteroinferior) in a 22-year-old girl following a traffic accident without any other injury. This trauma caused her to injure her left hip. Initial examination revealed total functional impotence of the left lower limb, with the hip in flexion abduction external rotation. Vasculo-nervous examination and skin examination were unremarkable. An emergency X-ray showed an obturator dislocation of the left hip. Emergency reduction under general anaesthetic and curarisation was performed in the operating theatre using the following manoeuvre: Initial traction in the axis of the limb followed by flexion of the hip in internal rotation and abduction while maintaining traction. The control X-ray was satisfactory and a post-reduction CT scan was performed, which confirmed the reduction and the absence of associated lesions and intra-articular fragments. A 15-day off-load was prescribed, with avoidance of external rotation for 4 weeks. Isolated obturator dislocations are treated orthopaedically. This reduction can be difficult in muscular patients. It is recommended that it be carried out under general anaesthetic with curarisation, and it is vital to avoid fracturing the neck. Dislocation of the obturator without fracture is not common in trauma practice. Its reduction is not always easy and can completely change the therapeutic prognosis.

## Surgical treatment of periprosthetic femur fractures arising after hip arthroplasty

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Periprosthetic fractures of the femur occurring after hip arthroplasty represent a significant and challenging complication in orthopedic surgery. These fractures occur around the femoral component of the hip replacement and can occur intraoperatively, postoperatively, or years after the initial arthroplasty surgery. Surgical intervention is often necessary to achieve optimal results in cases of periprosthetic femoral fractures after hip arthroplasty. The choice of surgical technique depends on a variety of factors, including the location and complexity of the fracture, bone quality, stability of the prosthesis, and patient factors such as age and comorbidities. Commonly used surgical techniques are open reduction and internal fixation (ORIF), where the fracture fragments are realigned and stabilized using plates, screws, or intramedullary nails. This technique is suitable for stable fractures with good bone quality and a well-fixed prosthesis. However, in cases of unstable fractures or weak bone mass, revision arthroplasty may be necessary. Revision surgery involves removing the existing prosthesis, addressing the bony defects, and fitting a new or revised prosthesis. Another emerging approach is the use of specialized implants such as locking plates and long-stem prostheses, which provide increased stability and fixation in challenging fracture patterns or compromised bone quality. The purpose of this study is to demonstrate the treatment approach for patients with periprosthetic fractures after hip arthroplasty at our institution, using multiple case reports.

## Twice Broken Cephalomedullary Nail – A Rare Complication

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### Background:

Intramedullary devices are a common choice when treating unstable trochanteric fractures. Both nailing variants - short and long nails - are frequently used. Implant breakage is rare, with a rate of cephalomedullary nail fracture between 0.2% and 5.7%.

### Case Presentation:

A 87-years-old female was admitted with a right intertrochanteric proximal femoral fracture. The patient was a candidate for fixation with short cephalomedullary nail. In the operation room, close reduction of the fracture and a cephalomedullary anterograde nailing was performed. The procedure took place without complications. The patient was discharged with recovery of gait with aids.

### Clinical Outcomes:

Six months later, the patient was readmitted after a fall from his own height. Plain radiographs demonstrated a fracture of the nail around lag screw hole. After removal of the implant, an attempt of re-fixation with a long cephalomedullary nail was performed, with a non-optimal reduction. One year after the surgery, the patient presented another fracture of the lag screw, possibly related to the inadequate fracture reduction, bone fragility or the lack of bone graft. Osteosynthesis material was removed and subsequent arthroplasty was carried out without complications.

### Discussion:

Cephalomedullary nails are common choices of treatment. Mechanical failures have been reported in 18 to 20.5% of cases, mostly related to a mal-union or non-union after an inadequate fracture reduction. The most common site of nail breakage is around lag screw hole, with the second being near to distal locking screw. Although different techniques are recommended, it remains a challenge for the orthopaedic surgeon.

## Avulsion Fracture of the Lesser Trochanter in Adolescents: A Case Report and Literature Review

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Isolated avulsion fractures of the lesser trochanter in adolescents are rare orthopedic injuries with limited literature available regarding their management and outcomes.

The most common etiology is a forceful contraction of the iliopsoas muscle during athletic activities such as jumping and gymnastics.

We present a case of a 15-year-old male circus performer with an isolated avulsion fracture of the lesser trochanter, accompanied by a comprehensive literature review of treatment protocols and time to return to sport in this type of injuries.

In this report, the adolescent presented with acute onset hip pain following a sudden rotational stunt. Physical examination revealed localized tenderness over the right proximal thigh and limited range of motion.

Radiographic evaluation confirmed the diagnosis of an isolated avulsion fracture of the lesser trochanter of the right hip.

Early recognition and appropriate management of isolated avulsion fractures of the lesser trochanter are essential to minimize long-term complications and optimize functional outcomes in adolescents.

Conservative treatment with rest, analgesia, and physical therapy was initiated, leading to gradual improvement in symptoms and return to activity levels over a six-week period.

This case highlights the importance of considering isolated avulsion fractures of the lesser trochanter in the differential diagnosis of hip pain in adolescents, particularly athletes.

Additionally, it emphasizes the role of conservative management as a viable treatment option in uncomplicated cases, with surgical intervention reserved for severe displacement or refractory symptoms.

Further research is warranted to elucidate optimal management strategies and outcomes in this type of fractures and population.

## "Strategic Interventions to Enhance Postoperative Care for Neck of Femur Fracture Patients: An Audit-based Approach"

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**Introduction:** In the UK, over 70,000 older adults annually suffer hip fractures, significantly impacting quality of life and increasing mortality and morbidity rates, emphasising the need for effective hip fracture services within comprehensive multidisciplinary frameworks. Ensuring prompt, thorough post-operative care is crucial for improving patient outcomes and minimising hospitalisation. However, inconsistencies in following post-operative protocols require analysis to boost protocol adherence and patient care, particularly after identifying and addressing barriers such as staff awareness and teamwork.

**Methods:** A retrospective audit at a major trauma centre focused on patients over 65 who had surgery for neck of femur fractures during two six-week phases. The study examined compliance with post-operative documentation, including surgical review on Day 0 and Day 1, checklist completions, physiotherapy assessments, and patient mobilisation.

**Results:** The audit comparison showed substantial progress in key areas: Orthopaedic Registrar reviews on the surgery evening jumped from 27% to 91%, day 1 Orthopaedic team reviews from 91% to 100%, and day 1 checklist completions from 53% to 86%. Although physiotherapy assessments remained high, a slight drop in mobilisation rates from 68% to 66% was noted, highlighting the importance of early mobilisation for shorter hospital stays.

**Conclusion:** The audits indicate significant advancements in post-operative care, especially in early reviews and checklist completions. Despite these improvements, mobilisation consistency requires attention. Future strategies might include weekend physiotherapy assessments, analgesia review, anti-nausea medication, and better hydration and nutrition, aiming to enhance patient care and shorten hospital stays, thereby improving clinical outcomes.

## Mortality rate and functional outcome in patients with hip fractures

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### Introduction

The globally increasing number of hip fractures presents a challenge in orthopaedic surgery, as these fractures pose a threat to patients mortality, functionality and life quality, especially taking into consideration concomitant injuries and the general health status of these patients.

### Material and Methods

We analyzed patients over 65 years who were admitted to the orthopaedic clinic UCCS, with femoral neck (Colli femoris/CF) fractures and intertrochanteric (IT) fractures. After forming the sample, we obtained information on demographics, Charlson Comorbidity Index (CCI), pre- and postoperative hemoglobin, transfusion needs and pre- and postoperative hospital stay, as well as mortality and functional status.

### Results

A total of 359 patients formed the sample, out of which 190 had CF and 169 had IT fractures. Operative treatment was conducted in 86,9% of patients. Demographics and CCI were comparable, most patients were female (76,9%), and the mean age was 80,4 years. Among patients who underwent surgery, patients with IT fractures, showed higher mortality (42%) than CF fracture patients (14,7%). Mean preoperative hospital stay was 5 days in CF and 5,7 days in IT patients. Six months after femoral neck fracture surgery, 29 (17,9%) patients reported that they were completely immobile, 74 (45,7%) were mobile with orthopaedic aids and 59 (36,4%) were completely mobile. From the patient group with intertrochanteric fractures, 26 (26,5%) were immobile, 65 (66,3%) were mobile with aids and 7 (7,1%) were completely mobile.

It can be concluded that elderly hip fracture patients have a high intensive care demand and require special attention during rehabilitation.

## Peri-implant fracture of distal femur with avascular necrosis of femoral head after TFNA with cement augmentation.

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A 77-year-old female patient presented with right sided four-part intertrochanteric fracture with subtrochanteric extension after a fall from standing height in August 2019 with a background of paroxysmal AF, hyperthyroidism, hypertension and hyperlipidaemia. She underwent fracture fixation using TFNA with cement augmentation and cerclage wire. Post op period was uneventful and she was allowed toe touch weight bearing to full weight bearing within 4 months with regular follow up. She presented again to ED after an unwitnessed fall in Oct 2023. She was diagnosed with a peri-implant spiral fracture of the femoral shaft extending to the metaphyseal region with femoral head fragmentation/collapse involving at least ~40-50% of the femoral head (FICAT stage 4) and TFNA cut out. She was managed with removal of implant, THR and surgical fixation of distal femur. This case report highlights the development of AVN following augmenting TFNA fixation with bone cement. The incidence of AVFH after trochanter fixation is 1.37% within the first 2 years of injury. Risk factors for the development of this complication are related to the severity of trauma, fragment geometry and fracture displacement. In conclusion, the cement augmentation of the TFNA blade may decrease risk of fixation failure. However, the surgeon must be aware of intraoperative adverse events such as guidewire penetration or cement leakage into the hip joint and AVN.



## The results of treatment of acetabular combat injuries

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**Keywords:** acetabulum, hip, combat injury. **Introduction:** this research is devoted to the stages of treatment of patients with combat injuries of the acetabulum. **Subjects:** patients with hip joint combat injuries. **Methods:** prospective analysis of the treatment of 17 patients in Kyiv clinics who sustained combat hip joint injuries in 2022-2023 was performed. Open injuries - 4 (23.5%); closed injuries - 13 (76.5%), which were divided into groups: elementary fractures (posterior wall - 4 (30.8%), posterior column - 2 (15.4%) and associated fractures (transverse and posterior wall - 4 (30.8%), posterior column and wall - 3 (23.0%). Patients with Pipkin type IV fractures - 7 (41.2%). Sciatic nerve damage in 7 (41.1%) patients, deep vein thrombosis (DVT) in 6 (35.3%). **Treatment algorithm:** for open injuries - debridement, wound closure, spacer followed by total hip arthroplasty (THA) with acetabular reinforcement rings - for all patients; for closed injuries - osteosynthesis in 10 (76.9%), THA in 3 (23.0%). **Results:** Harris Hip Score after 2 months -  $64 \pm 10$  points, after 6 months -  $68 \pm 11$  points. Inflammation of postoperative wound in 1 (5.9%) patient, hip dislocation - in 2 (11.8%). **Outcome:** combat injuries differ from standard ones. The main goal of open injuries treatment is wound closure in the shortest possible time and two-stage THA. Combat closed injuries are characterised by a high percentage of femoral head injuries and DVT, which delays surgical treatment and leads to the avascular necrosis (AVN). Treatment outcomes are significantly affected by associated soft tissue and nerve damage.

## Does the fracture of the lesser trochanter impact the course of surgery for a trochanteric fracture?

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Fracture of the trochanteric region is one of the most commonly encountered injuries in traumatology. The objective of our study was to describe the impact of lesser trochanter fracture on the surgical intervention of patients undergoing surgery for trochanteric fractures. The secondary objective was to propose, following a literature review, the optimal osteosynthesis method for this type of fracture. This was a descriptive and retrospective study conducted between 2010 and 2021, examining trochanteric fractures treated with short gamma nail in elderly individuals. Patients were divided into two groups based on lesser trochanter involvement. Epidemiological, clinical, radiological, and operative data were analyzed. Ninety-seven patients were included. The mean age of our patients was 80.1 years with a female predominance. The majority of patients (94%) had comorbidities, with hypertension being predominant. Lesser trochanter involvement was present in 71 cases (73% of the sample). Lesser trochanter involvement prolonged the duration of surgery from 158.65 to 188.70 minutes, increased the risk of bleeding with a decrease in hemoglobin of  $\geq 4\text{g/dl}$  in 5 patients, and increased the risk of shaft fracture with four cases versus zero in the other group ( $p < 0.05$ ). The bloody nature of the approach and potential change in surgical indication were not statistically significant in our study ( $p > 0.05$ ). Involvement of the lesser trochanter was associated with an increased risk of prolonged surgical duration, greater bleeding, and more shaft fractures during surgical management of trochanteric fractures with short gamma nail. Thus, evaluating lesser trochanter involvement before surgery can optimize patient management.

## Study on hyponatremia after traumatic hip surgery: A single center retrospective study

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Hyponatremia as a complication after hip fracture surgery can often rapidly deteriorate with serious and potentially life-threatening complications. We conducted a clinical audit from January 2022 to April 2024 on 84 consecutive patients who underwent hip fracture surgery in a tertiary care center. Parameters which included age, sex, procedure, pre operative and post operative day 3 sodium values, length of stay and Intensive Care Unit (ICU) admissions, were gathered retrospectively. We compared our results with the global standards of hyponatremia prevalence of 30% which is associated with 20% mortality and significantly longer hospital stays (7.7 days). Hyponatremia occurred in 15 (17.85%) of the patients, out of which 13 were mild and 2 were severe. ICU admission rates were higher in patients with hyponatremia (80% vs. 72.46%). The length of stay in hyponatremia as compared to normo-natremia (8.8 days vs 10 days), mean age (74.6 years vs 82.10 years) did not show any correlation to sodium values, although the mean length of stay was higher than the previous studies. Patients undergoing bipolar hemiarthroplasty showed the highest preponderance (25%) among the operative procedures with 8 out of 32 developing hyponatremia, more than Total hip Replacement (9.75%) and Proximal femur nailing (10%). It was more common in males (3:5). Global studies describe it to be more common in females (3:2).

## Comparison of dynamic screw-plate and antegrade intramedullary osteosynthesis in pertrochanteric fractures

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**Introduction:** During pertrochanteric fractures in the elderly, the main challenge of surgery is to obtain a solid osteosynthesis allowing immediate complete support, without fear of dismantling of the osteosynthesis (scanning of the cervico-cephalic screw), which requires a major surgical revision in fragile patients. This work aims to compare the DHS plate screw and PFNA nail in the treatment of pertrochanteric fractures. **Material:** a retrospective randomized study including 120 patients, urgently hospitalized in our department for pertrochanteric fracture, between 2016 and June 2022. **We analyzed:** the patient's condition, the surgical stage (the type of implant, the operating time), the postoperative period (blood loss, radiological analysis, length of hospitalization, immediate postoperative complications) finally remotely, the Harris functional index, the date of resumption of walking, mortality. **Results:** PFNA group compared to DHS group: PFNA was associated with less blood loss and a lower rate of fixation failure, with less operative time, but led to more fluoroscopy time. The average hospital stay was the same in both groups. Mechanical complications involved migration of the cervical screw outside the femoral head in 8 cases, favored by the instability of the fracture and the presence of osteoporosis. Walking time was 20 days on average in the intramedullary nailing group and 25 days in the screw-to-plate group. The mean Harris hip score was 60 in the intramedullary group and 59 in the screwed plate group. **Discussion:** Literature data demonstrate an advantage for intramedullary nailing, particularly a mechanical advantage for the treatment of pertrochanteric fractures. **Conclusion:** The PFNA allows the osteosynthesis of fractures of the upper end of the femur in osteoporotic patients with better results compared to the DHS dynamic plate screw.

## Trochanter stabilizing plate in periprosthetic hip fractures

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For the period from September 2020 until December 2023 we have operated 15 patients in the clinic of orthopedics and traumatology of UMHAT „Sveti Georgi” Plovdiv who due to high energy trauma had sustained comminuted periprosthetic fractures around the femoral stem. The patients were 9 males and 6 women with average age of 45 years. The period since primary endoprosthetic replacement in 12 patients was 7 years, in the remaining 3 patients was 1 year, one and a half years and 2 years respectively. During surgery in 12 of the patients the primary implanted femoral stem was replaced with cementless modular revision interlocking stem and in three of the patients we implanted cemented revision stem. In order to ensure better stability of the construct in all of the cases we did augmentation with trochanter stabilizing plate.

We followed up all patients for a period of one year. We did our evaluation on the basis of the postoperative X-Rays and functional score of the patients. We used the Harris Hip Score and we had excellent result in 13 of the patients (more than 90 points), good result in one (85 points) and satisfactory result in one patient (73 points). In high energy comminuted periprosthetic fractures the trochanter stabilizing plate plays important role by ensuring additional stability of the construct and by enabling the anatomic reduction. In this manner early verticalization and rapid functional recovery of the patient are achieved. Key words: periprosthetic fractures, hip joint, revision

## Publication trends and research hotspots of kinematic alignment in total knee arthroplasty a bibliometric analysis

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**Introduction:** kinematic alignment (ka) is a philosophy that aims to restore normal joint kinematics during total knee arthroplasty. this study aimed to explore the application of kinematic alignment in total knee arthroplasty through a bibliometric analysis. **Methods:** a search was conducted for articles related to kinematic alignment in total knee arthroplasty in the web of science database from 2008 to 2022. qualitative and quantitative analyses were performed using vos viewer and citespace. **Results:** a total of 392 articles were retrieved, and 231 articles were included after excluding non-article articles such as reviews and letters. the number of publications on the application of kinematic alignment in total knee arthroplasty has increased over the past 15 years. the united states, japan, and germany have made significant contributions in this field, with the university of california (davis) being the most productive institution. knee surgery sports traumatology arthroscopy had the highest number of publications and citations. stephen m. howell had the highest output and citation frequency. the top three keywords that appeared after excluding elements mentioned during data collection were "mechanical alignment," "flexion," and "survival." **Conclusion:** through a bibliometric analysis of scholarly output from 2008 to 2022, this study provides a comprehensive map of the fundamental knowledge structure in this area, highlighting the most influential countries, institutions, journals, and authors. the results provide a comprehensive perspective for researchers, helping to guide and inform the current state within this critical field of study.

## The effect of intraarticular tranexamic acid after total knee arthroplasty

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**Introduction:** The purpose of this study was to determine the effect of postoperative intra-articular injection of tranexamic acid (TXA) on reducing blood loss and transfusion after total knee arthroplasty (TKA). **Methods:** Total 184 patients who underwent TKA were included. Among them, for 84 patients in the TXA group, TXA injection (35 mg/mL) was administered into the joint space after joint space suture, and for 100 patients in the control group, it was not administered. The preoperative estimated patient's blood volume (PBV), hematocrit and change, total volume of drainage, transfusion rate, and blood loss up to 6 days postoperatively were compared between the two groups. **Results :** The postoperative hematocrit was significantly higher in the TXA group on both the 1st day (TXA group 31.7, control group 30.2,  $p=0.01$ ) and the 6th day (TXA group 31.3, control group 29.3,  $p=0.001$ ). The decrease in hematocrit in the 6th day postoperatively was significantly less in the TXA group ( $p<0.001$ ). The volume of drainage was 219.1 mL in the TXA group and 336.0 mL in the control group ( $p<0.001$ ). The rate of blood transfusion was 2/84 (2.4%) in the TXA group and 8/100 (8%) in the control group ( $p=0.191$ ). The predicted blood loss using hematocrit on the 6th postoperative day was 635.5 mL in the TXA group and 869.2 mL in the control group ( $p<0.001$ ). **Conclusion :** Intra-articular injection of TXA after TKA was effective in reducing the decrease in postoperative hematocrit and significantly reducing total drainage and blood loss.

## Simultaneous bilateral infection after total knee arthroplasty

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**Purpose :** The occurrence factors and clinical results were analyzed between patients who underwent revision surgery for infections that occurred simultaneously on both sides after total knee arthroplasty (TKA) and patients whose infections occurred only on one side after bilateral TKA.

**Method:** From 2016 to 2022, among patients treated for infected TKA, 20 cases of 10 patients who had simultaneous infection on both sides were compared with 43 cases where infection occurred only on one side after bilateral TKA. Two-stage revision surgery was performed in all patients, The factors and clinical results were compared. **Results:** Among the underlying diseases in the bilateral groups, patients with liver disease and hematologic malignancy showed a significantly higher prevalence of 6 cases each in the bilateral group than 3 cases and 2 cases, respectively, in the unilateral group ( $p=0.023$  and  $0.010$ ). HSS score was 78.5 and 76.8, Knee Society Knee Score was 80.0 and 77.7, respectively, and Function Score was 64.5 and 62.9, respectively. The WOMAC score was 35.6 and 33.8 points, respectively, with no statistically significant difference between the two groups. Recurrence after surgery occurred in 1 case in the bilateral group and 2 cases in the unilateral group and 2-stage revision surgery was performed again. **Conclusion:** Patients with simultaneous bilateral TKA infection had a higher rate of underlying liver disease and hematologic malignancy compared to patients with unilateral infection, and satisfactory results were obtained with 2-stage revision surgery in all cases.



## Correlation of the Oxford Knee Score and WOMAC questionnaires in the evaluation of gonarthrosis

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**Introduction:** The patient reported outcomes are a cornerstone of the evaluation of the results after surgery. The Oxford Knee Score and WOMAC questionnaires are widely used in patients suffering from knee osteoarthritis to evaluate their clinical status, and after total knee arthroplasty (TKA) to evaluate clinical results. **Methods:** 174 patients scheduled for a TKA completed the Spanish version of the Oxford Knee Score and WOMAC questionnaires as part of their preoperative evaluation. The results of these questionnaires globally, and their pain and function subsets, were then compared for correlation using the Pearson Method.

**Results:** The correlation coefficient between the Oxford score and the WOMAC score was -0.83. Similarly, a correlation of -0.77 and -0.79 can be estimated for the function and pain components, respectively. In all these correlation coefficients, p-values lower than 0.001 were obtained and therefore are considered statistically significant. **Discussion and conclusion:** The Spanish version of the Oxford Knee Score and WOMAC questionnaires are validated tools for the clinical evaluation of knee osteoarthritis. Both questionnaires studied, showed a high correlation and either of them can therefore be used in the evaluation of knee osteoarthritis.

## Comparison of trochlear congruence in axial plane between kinematic alignment and mechanical alignment in total knee arthroplasty

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Patient specific alignment concept might improve clinical outcomes in total knee arthroplasty (TKA). In kinematic alignment (KA), axial alignment is decided essentially parallel to the posterior condylar angle (PCA). KA TKA produces near-normal knee kinematics, but increases patellofemoral contact stresses in comparison of mechanical aligned (MA) TKA. Purpose of this study is performed to compare trochlear congruence (TC) between using KA and MA in TKA. This study included 155 patients (107 knees) who underwent TKA with a robotic assisted system (Mako, Stryker, Kalama-zoo, USA). In the pre-operative implant planning step, we applied MA and KA planning in axial plane on the same knee for all TKA trials. According to displayed images, we evaluated the TC which was classified into 4 groups (1, congruence; 2, mild incongruence; 3, moderate incongruence; 4, severe incongruence). Also, we performed a correlation analysis between the transepicondylar axis (TEA) and PCA and TC. Compared with MA TKA, KA TKA showed more higher trochlea incongruence (TI) (group 1 (MA:KA = 42:2), group 4 (MA:KA 6:71)). In MA TKA, PCA and TEA were not correlated with TI. (Pearson correlation coefficient ( $r$ ) = -0.11150 and -0.02141, respectively). In KA TKA, TEA was negatively correlated with TI (Pearson correlation coefficient ( $r$ ) = -0.5875). In KA TKA, a more TI was anticipated. Larger PCA, there was a higher incidence of the TI. These might be caused by a individual bony geometry and current design of femoral component. So, further study is needed to analyze the impact of TI on patellofemoral kinematics using KA.

## Unicompartmental Arthroplasty in Avascular knee Osteonecrosis: Case Controlled Study

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**Aim:** Primary (or spontaneous) (SONK) and secondary osteonecrosis of the knee can lead to severe osteoarthritis of the knee, primarily affecting the medial compartment, for which either total or unicompartmental arthroplasty may be considered. Our goal was to ascertain whether primary SONK might be effectively treated by unicompartmental knee arthroplasty.

**Methods:** This is control case study in witch we examined the functional results of six SONK patients (4: Males and 2: Women) who underwent UKA with a fixed-bearing design at a single center. The mean patient body mass index was 28.2, and was diagnosed of SONK using x ray and confirmed by (MRI). The mean follow up was 47 months.

**Results:** Reduced Oxford Knee and HSS scores following UKA demonstrated significant improvements in function, and no particular problems followed the operations. Survivorship free of any revision for all our patients at the last follow up.

**Discussion:** When treating patients with primary SONK, orthopedic surgeons have UKA as a valuable tool in their toolbox. Functional outcomes and good survivability provide credence to this argument. Though additional investigation is required to fully comprehend the genesis and course of the illness process, UKA is still a feasible and more kinematically friendly choice that may have a greater success rate than other surgical options. The long-term results of UKA for osteonecrosis are comparable to UKA for osteoarthritis.

**Conclusion:** UKA is a durable and efficient option to treat patients with unicompartmental osteonecrosis of the knee.

## Bilateral simultaneous unicompartmental knee Arthroplasty: is it a safe procedure.( Case control study)

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Although total knee arthroplasty (TKA) is the most commonly used procedure to treat end-stage knee osteoarthritis, unicompartmental knee arthroplasty (UKA) is a valid alternative in 25% of patients with the disease in which only affects one compartment. Bilateral knee osteoarthritis is common in a quarter of patients with bilateral symptoms. In such cases, a bilateral UKA would be an appropriate surgical procedure. This can be done either simultaneously in one stage surgery or in 2 stages. Selected patients have the potential benefits of lower cost, shorter hospital stay and a shorter overall recovery process. Despite this, they fear that operating on both knees in a single surgery could increase the risk of complications; morbidity and mortality rates.

We report the case of a 54-year-old patient, suffering from bilateral knee osteoarthritis evolving for more than 15 years, arriving at the stage of functional disability after exhaustion of all medical therapeutic methods creating a real physical and socio-professional handicap, radiologically at stage 3 of bilateral Ahlback. The patient underwent simultaneous bilateral unicompartmental knee arthroplasty, the postoperative course of which was simple and similar to that of unilateral or two-stage UKA.

Simultaneous bilateral UKA is an effective procedure and leads to improved clinical and radiological outcomes. Simultaneous bilateral UKA is comparable to two-stage bilateral UKA in terms of safety as it did not result in higher blood loss or complication rates and was found to be superior in clinical outcomes with significantly lower cost.

## Radiographic measurement for predicting the risk of periprosthetic tibial plateau fracture after Oxford cementless unicompartmental knee arthroplasty

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**Introduction:** The periprosthetic fractures after UKA still persist. We aims to develop novel proportion parameters to predict the risk of periprosthetic fractures following cementless UKA, accounting for variations in bone size.

**Methods:** A single institute, retrospective study included 79 knees, divided into fracture (14 knees) and non-fracture (65 knees) groups. Post-operative radiographic measurements were utilized to evaluate the depth of vertical tibial cut, depth ratio of tibial cut, the depth ratio of Keel cut, and the distance from the tip of the keel cut to the lateral cortex. ROC analysis with Youden index method was performed to identify optimal cutoff points for predicting fracture risk.

**Results:** Our findings showed significant differences between the fracture and non-fracture groups in various post-operative measurements and pinpointed specific cutoff points for the depth ratio of tibial cut exceed 0.517, the depth of vertical tibial cut more than 1.31 cm, and the depth ratio of keel cut more than 1.603, which accurately predicted fracture risk. We calculated ICC for each parameter demonstrating good to outstanding reliability.

**Conclusion:** Our study provides insights into the predictive factors for periprosthetic fractures following UKA. Specifically, we determined that the depth of the vertical tibial cut, the depth ratio of the tibial cut, the depth ratio of keel cut, the lesser varus of tibial component position, and the keel-to-tibial cortex distance in the lateral view are key factors linked to fracture risk.

## Predictive Factors for Lower Limb Alignment Following Medial Unicompartmental Knee Arthroplasty

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The objective of this research was to determine the factors influencing the hip–knee–ankle (HKA) angle subsequent to Oxford medial unicompartmental knee arthroplasty (MUKA). A retrospective analysis was conducted on 200 patients who underwent Oxford MUKA between June 2018 and October 2020. Univariate and multivariate analyses were employed to assess the impact of surgical and radiographic characteristics on the postoperative HKA angle. Preoperatively, the mean HKA angle was  $9.5 \pm 4.3^\circ$ , while postoperatively it measured  $3.6 \pm 3.7^\circ$  ( $p < 0.001$ ). The postoperative HKA angle was significantly associated with preoperative HKA angle, bearing size, tibial component alignment angle, and BMI ( $r = 0.71$ ,  $p < 0.001$ ;  $r = -0.24$ ,  $p = 0.001$ ;  $r = 0.21$ ,  $p = 0.004$ ;  $r = -0.18$ ,  $p = 0.011$ ). Multiple linear regression analysis demonstrated that preoperative HKA angle ( $\beta = 0.68$ ,  $p < 0.001$ ), bearing size ( $\beta = -0.31$ ,  $p < 0.001$ ), tibial component alignment angle ( $\beta = 0.14$ ,  $p = 0.003$ ), and BMI ( $\beta = -0.09$ ,  $p = 0.047$ ) significantly influenced the postoperative HKA angle. In summary, greater preoperative varus deformity, smaller bearing size, increased varus alignment of the tibial component, and lower BMI were associated with greater postoperative varus alignment of the lower limb in Oxford MUKA. These findings offer valuable insights for surgeons to better anticipate postoperative lower limb alignment and mitigate malalignment in Oxford MUKA procedures.

## Effect Of Oral Serratiopeptidase on Drain Collection Post TKA In Patients Receiving LMWH – A Retrospective Case Control Series.

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**Introduction:** Meta-analyses have shown that post-operative drain collection (blood) in patients undergoing TKA does not have statistically significant difference due to low molecular weight heparin (LMWH) use. However, there is sporadic case reports of surgeons reporting increased drain collection due to LMWH use. Most Indian surgeons use serratiopeptidase, either alone or in combination, in TKA patients post operatively to reduce swelling. Serratiopeptidase being a serine protease has high substrate specificity and fibrinolytic activity. **Materials & Methods:** Retrospective analysis was performed assessing patient records. Patients were identified as having increased drain collection (IC) or standard drain collection (SC). Records were checked to sub classify both the groups into I) received Serratiopeptidase II) not received Serratiopeptidase . Odds ratio was performed on this 2x2 table thus generated to ascertain effect of Serratiopeptidase on increased blood collection. **Results –** Odds Ratio was greater than 1. **Discussion-** LMWH exerts its action by activating anti thrombin III and preventing the conversion of fibrinogen to fibrin, thereby reducing clots formation. However, cutting across different subspecialities, it is established by different meta analyses that LMWH does not increase immediate blood collection from wound in otherwise healthy patients. Serratiopeptidase breaks down the final hemostatic clot by proteolysis. **Conclusion:** Serratiopeptidase, as our odds ratio shows, exerts an additive effect with LMWH resulting in increased collections. Therefore, the medication is best avoided in patients receiving LMWH.

## Traumatic Anterior Total Knee Arthroplasty Dislocation with Vascular Injury. Treatment with Knee-Spanning External Fixation.

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Introduction: traumatic anterior dislocation following total knee arthroplasty (TKA) is complicated by an increased risk of instability and a high rate of nerve and vascular damage. We present a case of traumatic anterior dislocation after primary TKA with simultaneous injury of the popliteal artery treated with popliteal artery bypass and knee-spanning external fixation. Material- Method: a 67-year-old woman was referred to our institute after a low-energy fall and injury of her left knee. The patient had a history of primary CR-TKA a decade ago. The physical examination revealed an anterior displacement deformity of the tibia and an absence of the distal pulses below the knee. Radiographic examination showed anterior knee dislocation. An emergency CT angiography demonstrated popliteal artery occlusion. A closed reduction of the knee joint was performed. After closed reduction, a C-arm image intensifier revealed a congruent but unstable reduction of the TKA components. A bypass at the occult popliteal artery was also performed. Afterwards, the knee joint was stabilized with a knee-spanning external fixator at 30° flexion. Results: leg circulation was successfully restored after surgery, and the external osteosynthesis-bridging system of the knee maintained stability in the joint. After two weeks, the patient was allowed to bear partial weight on the affected knee. The external fixator was removed at eight weeks, and the knee joint was protected with a knee goniometer brace for six months. Conclusion: traumatic anterior tibiofemoral dislocation after primary TKA is a rare but severe injury which must be followed by prompt surgical exploration.



## Outcomes of using drain vs non drain in Total Knee Replacement : A prospective comparative study

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The use of drains following total knee replacement (TKR) continues to remain debatable . We evaluated haemoglobin (Hb) levels, drop in hematocrit levels, and wound complications to compare closed suction drains and no drains following TKR. Methods: A total of 79 was obtained through convenient sampling technique between September 2019 – October 2022 at Mayo Hospital Lahore. The senior consultants directly executed every procedure while adhering to a set ERAS protocol. The study population was divided into 2 groups two groups; group 1 with drain and group 2 without drain by using a lottery method. Secondary parameters e.g. length of hospital stay, 30-day reoperation rate, and infection were measured. Results: Out of 43 patients in Group A (Drain), there were 12 (27.9%) males and 31 (72.1%) females, while amongst 36 patients in Group B (without drain), there were 10 (27.8%) males and 26 (72.2%) females. The mean variation of Hct in Group A was 4.37 and 2.51 in Group B ( $p = 0.001$ ). The mean hemoglobin drop in Group A was 1.8 and 1.5 hemoglobin was reduced in Group B ( $p < .001$ ). The length of stay in patients with a drain was  $3.6 \pm 1.4$  while  $2.8 \pm 0.5$  was observed in patients without a drain ( $p=0.0017$ ). Conclusion: With drains, more blood loss and longer hospital stays were observed. The difference between the two procedures in terms of 30-day re-operation rate and wound complications was not significant. Current evidence does not support the use of drains in arthroplasty.

## Anterior cruciate ligament and meniscal tears: Is there a relevance to osteoarthritis clinical findings?

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**Objective:** To investigate the prevalence of anterior cruciate ligament (ACL) and meniscal root tears in patients who underwent unilateral total knee arthroplasty (TKA) for knee osteoarthritis (OA) and examine the relationship between these tears and relevant clinical parameters (including lower limb alignment angles). **Methods:** This retrospective study included 486 patients (486 knees) who had undergone TKA between March 2021 and February 2023. The presence of root tears of the medial and lateral meniscus posterior horn and ACL tears were checked for all patients. Statistical analyses were performed to assess the relationship between these tears and clinical factors, including age, gender, body mass index (BMI), joint line convergence angle (JLCA), mechanical femoral mechanical tibial or varus angle (MFMTA or VA), medial proximal tibial angle (MPTA), lateral distal tibial angle (LDTA), and lateral distal femoral angle (LDFA). **Results:** ACL tears were observed in 130 knees (26.75%) and were correlated with age ( $p=0.002$ ), JLCA ( $p<0.001$ ), MFMTA (VA) ( $p<0.001$ ), MPTA ( $p=0.025$ ), and LDTA ( $p=0.017$ ). Medial meniscus tears were observed in 130 knees (26.75%) and were correlated with age ( $p=0.005$ ), JLCA ( $p=0.009$ ), MFMTA (VA) ( $p=0.007$ ), and MPTA ( $p=0.049$ ). A lateral meniscus tear was observed in 26 knees (5.35%) and was not correlated with any of the parameters. **Conclusion:** Most Factors which were thought to correlate with OA and its severity, also correlated with ACL tears. Some also correlated with medial meniscus posterior horn root tears, but none were correlated with lateral meniscus posterior horn root tears, possibly due to insufficient sample size.

## Early clinical outcomes in Robotic Assisted Total Knee Arthroplasty in obese

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Total Knee Arthroplasty (TKA) is associated with increased risk of perioperative complications and can be hindered by technical difficulties due to anatomic variations & co-morbidities in obese individuals. Patient related outcome measures (PROMs) are an important predictor of success after TKA. The purpose of this study was to evaluate Patient Related Outcome Measures (PROMS) namely 12-Item Short Form Survey scores and Oxford Knee Society Score in non-obese and obese undergoing primary robotic assisted TKA. A prospective study of 67 TKA (n= 35 non-obese, n= 32 obese) were performed by a single surgeon using CORI robotic system from 1st January 2021 to 1st January 2024 in a tertiary care hospital in India. The average BMI in the non obese group was 24.05 and that in the obese group was 37.33. Apart from demographics, pre-operative and post operative HKA axis, PROMs were measured. Age, estimated blood loss & drop in haemoglobin were not significantly different between the cohorts. The mean length of hospital stay was higher in obese (8.15 vs. 6.14) but not statistically significant. The obese scored lower in SF-12 and OKSS both pre-operatively and postoperatively, but the improvement in functional outcome was equal. There was one case of peri-prosthetic fracture at the pin site in the obese group and one case of superficial wound infection in the non-obese cohort. Obesity had no significant effect on the post-operative alignment and complication rates. These findings demonstrate robotic assistance for TKA can reliably achieve consistent and comparable results in obese individuals.

## Does Postoperative Low-Dose Duloxetine Provide Analgesic Effect and Morphine Consumption after Primary Total Knee Arthroplasty? A Prospective, Double-Blind, Randomized Controlled Trial

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**Background:** Duloxetine as an adjunct analgesic has shown effective results in trials of patients undergoing TKA. However, the regimen has not been standardized. We, therefore, evaluated the analgesic efficacy of low-dose duloxetine after TKA.

**Methods:** We conducted a double-blind, randomized controlled trial of patients undergoing unilateral primary TKA, comparing 30 mg/d of duloxetine for 6 weeks as an additive medication for pain control to modern multimodal analgesia after TKA. The primary outcome measure was a visual analogue scale (VAS) for pain at rest, during walking, and at night at 24 hours, 72 hours, 2 weeks, 6 weeks, and 12 weeks after the operation. Secondary outcomes were morphine consumption, adverse events, and functional outcomes: Oxford Knee Score (OKS), Knee injury and Osteoarthritis Outcome Score (KOOS).

**Results:** Mean VAS for pain at rest, during walking, and at night at 24 hours, 72 hours, 2 weeks, 6 weeks, and 12 weeks showed no significant differences between the two groups, except a significantly lower mean VAS at night at 2 weeks in the duloxetine group. Mean total morphine consumption (0-72 hours) was 33% less in the duloxetine group ( $6.8 \pm 5.7$  vs.  $10.2 \pm 7.3$  mg,  $p=0.04$ ). There were no significant differences in adverse events and functional outcomes except better KOOS symptoms at 6 and 12 weeks in the duloxetine group.

**Conclusion:** Low-dose duloxetine reduced postoperative morphine consumption, VAS pain at night, and KOOS symptoms at 6 and 12 weeks with good tolerability. Low-dose duloxetine is a promising addition to multimodal pain protocol for patients after TKA.

## Does Unicompartmental Knee Arthroplasty Provide Faster Recovery and Better Clinical Outcomes than Meniscal Root Repair in Medial Meniscus Posterior Root Tear in Elderly Patients?

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**Background:** Medial meniscus posterior root tear (MMPRT) critically impairs hoop tension and accelerates knee osteoarthritis. Treatment with meniscal root repair (MRR) in the elderly is controversial because unpredictable tissue healing and cartilage damage resulted in shifting treatment to unicompartmental knee arthroplasty (UKA). We aimed to investigate the treatment outcomes of UKA compared with MRR and nonoperative treatment.

**Methods:** We conducted a retrospective case study of patients aged 50-79 diagnosed with MMPRT by magnetic resonance imaging. Patients were excluded if they had any severe medial osteoarthritis knee (Kellgren-Lawrence, KL-IV), mild-moderate medial osteoarthritis (KL-I-III) with varus deformity  $>5^\circ$ , ligamentous instability, and follow-up  $<1$  year. All patients were followed at 6 weeks, 6 months, and 1 year after treatment, and the functional outcomes and visual analog scale (VAS) for pain were evaluated.

**Results:** A total of 153 patients were included and composed of 3 groups: nonoperative treatment (67 patients), MRR (60 patients), and UKA (26 patients). At 6 weeks after treatment, the UKA group showed significantly better Knee injury and Osteoarthritis Outcome Score (KOOS), Tegner activity score, and VAS for pain than MRR and nonoperative treatment; these findings persisted for 1 year ( $P<0.05$ ). In contrast, there was no difference between the MRR and the nonoperative treatment. Further operations were needed in the nonoperative (3%) and MRR (3.3%) groups.

**Conclusion:** UKA in elderly patients with MMPRT resulted in better functional outcomes and pain relief than MRR up to 1 year after treatment. UKA should be considered as an option in elderly patients with MMPRT.

## Patellectomy for Wound Closure in Total Knee Arthroplasty: A Case Series

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Total Knee Arthroplasty (TKA) is a commonly performed procedure for individuals with arthritic knees and those with Pigmented Villonodular Synovitis (PVNS). The closure of the wound after the procedure is as critical as the actual replacement surgery. The use of optimal closure techniques aims to reduce post-operative complications and operative time. Moreover, extended operative time was linked to an elevated risk of periprosthetic joint infection (PJI). This case-series reports on four TKA patients who underwent patellectomy to enable primary skin closure, because standard closure methods was not possible. We found favorable results with the use of the patellectomy technique for wound closure during TKA in the four patients presented in our institution. None of these cases showed recurrent wound complications. All of them experienced extensive pain relief. Extension lag was seen in one patient. It is crucial to prevent post-surgical PJI following TKA. Total patellectomy can be a good solution for primary skin closure when other options like flaps or skin grafts are not possible or may pose the patient at risk of PJI, especially in elderly patients with previous histories of surgical site infection.

## Knee instability due to polyethylene migration: A rare presentation

Ana Flávia Resende<sup>1</sup>, Luísa Negrão<sup>1</sup>, Marta Lages<sup>1</sup>, Joana Mendes<sup>1</sup>, Margarida Teixeira<sup>1</sup>, Rui Sousa<sup>1</sup>, Francisco Agostinho<sup>1</sup>, Zico Gonçalves<sup>1</sup>

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**Introduction:** The increasing number of primary knee arthroplasties and the average life expectancy are associated with the increase in revision surgery. Instability may be due to poor ligament balance, loss of integrity of the collateral ligaments, wear of the polyethylene, incorrect orientation or size of the components.

**AIM:** The authors present a case of a patient who underwent revision due to anterior migration of polyethylene, associated with pain and instability.

**Clinical case:** M, 77 years old, 9 years TKA, follow-up annually. Presented with progressive worsening of mechanical anterior knee pain associated with flexion, 3 years of evolution. Episodes of instability and joint effusion. ROM: -10°, 90°. Tenderness on anterior surface, extensor mechanism competent, laxity to varus/valgus stress at 30°, without instability in extension. Serial knee radiographs (2006-2016) showed: Radiopaque image, contours compatible with the anteriorly displaced polyethylene and progressive increase in the anterior contour of soft tissues.

The patient underwent Revision Surgery where it was evident anterior migration of polyethylene, femoral and tibial loosening due to "metal-to-metal" contact and consequent metallosis, competence of the collateral ligaments.

**Conclusion:** Instability of TKA can have several causes, including polyethylene migration, leading to a cascade of events, which may culminate in the need for a revision of all components. Early identification and treatment can be determining factors for less aggressive, simpler approaches with a lower probability of complications. This case highlights the importance of carefully evaluating knee radiography, identifying all components of the prosthesis, including polyethylene, and their relationships with each other.

## The Cost-Effectiveness of Unicompartmental Knee Arthroplasty (UKA) and High Tibial Osteotomy (HTO) for the Treatment of Medial Compartment Knee Osteoarthritis (MCOA)

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The study evaluates the clinical outcomes, costs, and long-term benefits associated with UKA & HTO procedures to provide insights into the most cost-effective approach.

**Introduction:** UKA and HTO are two surgical interventions commonly used to alleviate pain and improve function in patients with MCOA. This study aims to assess the cost-effectiveness of these procedures, considering both short-term outcomes and long-term benefits.

**Methods:** A systematic review of the literature was conducted to identify relevant studies comparing the cost-effectiveness of UKA and HTO for MCOA treatment. The selected studies were critically appraised, and the data were synthesized to provide an overview of the cost-effectiveness of each procedure.

**Results:** The findings indicate that both UKA and HTO are effective in relieving pain and improving function in patients with MCOA. However, UKA has been shown to provide better long-term outcomes, including higher patient satisfaction rates and lower revision rates compared to HTO. While UKA generally involves higher upfront costs, it offers significant cost savings in the long run due to the reduced need for revision surgeries.

**Discussion:** The cost-effectiveness of UKA and HTO depends on various factors, including patient characteristics, surgeon expertise, and healthcare system preferences. While HTO may be a more cost-effective option in certain cases, especially for younger patients with less severe disease, UKA appears to offer superior long-term outcomes and cost savings.

**Conclusion:** UKA appears to be a more cost-effective treatment option for MCOA compared to HTO. However, individual patient factors and preferences should be considered when making treatment decisions



## A Rare complication of Robot Assisted Total Knee Replacement - Spontaneous Recurrent Hemarthrosis and its management

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Introduction:

Spontaneous Recurrent hemarthrosis following total knee replacement is a relatively rare complication being reported in up to 1.6% of patients. The aim of this case report presentation is to help in early identification and managing this rare complication. We present a case of early presentation of recurrent spontaneous hemarthrosis after robot assisted total knee replacement. Case report: A 69-year-old male underwent right side robotic assisted total knee replacement for severe grade 4 knee osteoarthritis in August 2023. After recurrent swellings and ruling out Infection, he had Ct angiogram which identified a Pseudoaneurysm arising from the inferior medial genicular artery which was embolized using 250 microns particles- embospheres and 2mm push able coils. Pictures attached.

Discussion:

After embracing the innovation of robotic assisted total knee replacement around the globe, we should keep in mind about spontaneous recurrent hemarthrosis in cases of recurrent swelling. Treatment modalities including conservative management as mentioned above should be trailed, further steps after diagnosis using angiography should be leading to selective arterial embolization, which has showed promising results.

Conclusion:

After robotic assisted total knee replacement, in cases of recurrent swelling a high index of suspicion is imperative for the early diagnosis of spontaneous hemarthrosis. After a trial of conservative management , infection and blood coagulopathy should be ruled out. Further steps should be angiography for diagnosis and selective arterial embolization of the geniculate arteries for appropriately selected patients.

## Femoral kinematics of the Japanese "SEIZA" sitting position (150 degrees) after CR-type TKA

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Introduction: In addition to the pain relief provided by total knee arthroplasty (TKA), it is essential for most Asian lifestyles to recreate good knee joint function for sitting on the floor. The Japanese "SEIZA" sitting position (150 degrees) after CR-type TKA in the Japanese population in the last few years has been reported. The knee flexion must be 130 degrees for sitting cross-legged on the floor, and nearly 150 degrees for sitting up straight ("SEIZA" sitting) on the floor. We have challenged the "SEIZA" sitting after CR-type TKA with our knowledge and experiences focusing on the size of femoral component (FC). We have placed the same size FC in the original position (flexion), considering the physiological flexion position of the distal femur in Japanese patients. We previously reported that the femoral component placement angle ( $\gamma$  angle) is one of the intraoperative factors for orthopedic knee after CR-type TKA surgery. Aim: This study aimed to conclude the factors to achieve the Japanese "SEIZA" sitting on the floor by reflecting upon our data focusing on the kinetics of femur. In conclusion, femoral component size is an intraoperative factor for the "SEIZA" sitting knees after CR-type TKA. We suggest that our technique for Japanese "SEIZA" is suitable for Islamic prayers.

## Unicondylar knee arthroplasty - five-year follow-up

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**Introduction:** On a global scale, we are seeing an increase in demand for knee arthroplasty, both total (TKA) and partial (PKA) prosthesis. There is an opportunity to conduct both short-term and long-term studies with the increasing number of partial prostheses being implanted. The findings from these studies can guide our decision regarding the appropriate indication for PKA and provide a summary of the postoperative outcomes and complications of operated individuals.

**Methodology:** A retrospective study, conducted at the Clinic for Orthopedic Surgery and Traumatology of the University Clinical Center of Serbia, evaluated the results of a five-year follow-up period in patients who were implanted with an Oxford® PKA due to anteromedial knee arthrosis. Between January 1st, 2016, and June 30th, 2018, a total of 95 patients underwent surgical procedures, 90 of whom were included in the study.

**Results:** According to the Knee Society Score, overall results of the Oxford® PKA demonstrated excellent results in 84(93.33%), good in 4(4.45%) and poor in 2(2.22%) patients. The average Knee Society score is 84 (18-92), with an incidence of medical complications of 7.78%(n=7). The revision rate was 4.44%(n=4), indicating that the UMPK had a "survival" rate of 95.56% during the course of the five-year follow-up period.

**Conclusion:** The five-year follow-up period of patients who had Oxford® PKA implants demonstrates that proper patient selection, meticulous operating technique, and an adequate annual prosthesis implant rate all contribute to favorable postoperative results. A limitation of our study is the small sample size of individuals who underwent surgery.

## Is revision knee arthroplasty always successful?

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Total knee arthroplasty (TKA) is a widely performed surgical procedure and an effective treatment option for advanced knee osteoarthritis. However, despite its increasing frequency, revision TKA continues to present a formidable challenge for orthopedic surgeons and patients alike. This study aimed to assess the causes and clinical outcomes of revision TKA procedures. A retrospective analysis was conducted on 62 patients who underwent revision TKA at the Department of General Orthopedics III, Institute for Orthopaedics Banjica, between 2010 and 2022. Data encompassed demographic profiles, primary TKA etiologies, revision causes, complications, and clinical assessments utilizing Knee Society Score, WOMAC, and VAS satisfaction measures. The mean follow-up duration was 64 months. The primary causes of TKA were predominantly osteoarthritis (64%), post-traumatic arthritis (11%), and rheumatoid arthritis (18%). Notably, infection emerged as the leading cause of revision (43.5%), followed by aseptic loosening (22.5%), instability (11.3%), and periprosthetic fracture (11.3%). Analysis revealed significant improvements in mobility (preoperative KSS: 42.0, postoperative KSS: 82.6), pain reduction (preoperative VAS: 62.7, postoperative VAS: 23.8), and enhanced functionality (preoperative WOMAC: 62.9, postoperative WOMAC: 31.3) among aseptic patients. Conversely, improvements were less pronounced in the septic group (preoperative KSS: 38.5, postoperative KSS: 79.3; preoperative VAS: 61.2, postoperative VAS: 27.6; preoperative WOMAC: 63.8, postoperative WOMAC: 33.7). Revision TKA necessitates a systematic approach and continuous refinement of strategies to enhance clinical outcomes. Limitations include a modest sample size and lack of long-term follow-up. Aseptic loosening and infection emerged as primary complications, underscoring the need for tailored therapeutic approaches and individualized patient management.

## Factors affecting satisfaction after implantation of a total knee endoprosthesis

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Knee osteoarthritis (OA) is one of the most common diseases of the osteo-articular system. The most common surgical treatment of advanced OA consists in replacing the knee joint with an endoprosthesis. The implantation of a total knee endoprosthesis is an established, proven and very well-known method of treatment in the case of advanced arthrosis, as the most common indication for this operation. Worldwide experience of more than 40 years, with different materials and techniques of implantation in a huge number of patients. With advanced surgical techniques, as well as advances in manufacturing technology and materials, the indications for knee arthroplasty are expanding.

The motive for the research is the fact that up to 20% of patients who are dissatisfied with this method are mentioned in the literature, despite the fact that it is the most frequent surgical intervention. The aim of the research was to identify the factors that influence satisfaction with the performed intervention. The research included 60 patients divided into two groups. Follow-up of patients will be up to 2 years postoperatively at 6-month intervals. HSS score, VAS and SF 36 scores were measured. Male patients increase the chance 3 times (OR= 3.4000 95% CI: 1.0322-11.1998) of registering good HSS results compared to females. Normal weight patients (OR= 0.2477 95% CI: 0.0704-0.8708) are 75% less likely to register lower HSS scores than overweight patients. A significant association was registered between pain intensity before surgery versus HSS score system control (at 6, 12 and 24 months) for  $p < 0.05$  (Pearson Chi-square: 3.9019,  $p = .048230$ )

## Continuous Distal Femoral Triangle Block versus Continuous Femoral Nerve Block for pain relief after Total Knee Arthroplasty. A randomized control study

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**Purpose:**TKR is a procedure often associated with intense post-operative pain. Pain can cause limitation in the ROM and can lead to a poor functional outcome. Effective pain relief is essential to initiate early rehabilitation and postoperative recovery. This randomized study was done to study the effectiveness of distal femoral triangle block as compared to femoral nerve block for postoperative analgesia and its effect on enhanced recovery after surgery. **Methods:**The patients were randomized into two groups of 30patients each. The randomization was done using-a-closed-envelope method. Group FT received a-continuous femoral triangle block after the procedure. Group FN received continuous femoral nerve block.Both groups were given 20ml of 0.2% ropivacaine as a-bolus followed by infusion. The ANOVA test was used to analyze the difference between the numerical variables over-a-time. A difference with p-value<0.05 was considered statistically significant. 95%confidence intervals were calculated. **Results:**The quality of postoperative analgesia was better in group FT as compared to group FN. Duration of analgesia (time from the end of surgery to development of VAS score >3) in the block group FT was 14.1hrs with an SD of  $\pm 7.5$ hrs was 5.3hrs in group FN with an SD of  $\pm 3$ hrs. p-value of 0.00 indicates a significant statistical difference between the groups. Morphine requirement in group FT was  $3.8\text{mg}\pm 3.4\text{mg}$  while in group FN was  $8.6\text{mg}\pm 4.0\text{mg}$ . A t-value of 4.9 with a corresponding p-value of 0.00 indicates significant statistical difference between the groups. Concluded that a continuous femoral triangle block provides superior analgesia as-compared to femoral nerve block enhancing patient satisfaction.

## Proximal tibial metaphysis stress fracture and knee osteoarthritis treated in single stage procedure: Long tibial stem Knee arthroplasty viable and safe option

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With about 790 000 procedures per year in US alone, total knee arthroplasty presents one of the most joint replacement procedures done. With increasing rate of surgeries, it is expected that surgeons encounter concomitant conditions that can complicate primary total knee arthroplasty. In our poster we wanted to present two cases of grade 4 knee osteoarthritis, according to Kellgren-Lawrence score, complicated with proximal tibial metaphyseal pseudoarthrosis treated in single stage procedure, knee arthroplasty with tibial long stem. As rare condition, tibial metaphysis stress fracture is usually seen in younger, more active patients with repetitive stress, and can be treated with simple activity modification, while, in this case can complicate knee osteoarthritis treatment and rehabilitation.

## A Survey of Scottish Committee for Orthopaedics and Trauma (SCOT) Members on Their Practices For Lower Limb Joint Replacements In Morbidly Obese Patients

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**Background:** Scotland has one of the highest rates of obesity in the developed world. **Objectives:** The primary aim of this paper was to investigate our cohort's decision making in managing and operating on patients with high BMIs. The secondary aims were to explore our cohort's adherence to SCOT guidelines. **Study Design & Methods:** An online survey was sent to the members of SCOT. **Results:** 62 responses were collected. The experience ranges from 1-44 years working as a consultant. 61% were aware of the SCOT guidelines. 72% respondents will offer lower limb arthroplasty to obese patients with BMI>40. 35% will get a second opinion and 22% will discuss these cases in an MDT. 71% were aware of the local guidelines for weight management. 84% will give advice about lifestyle and healthy eating and 13% will ask the GP to do so. 18% will ask the GP to prescribe medications for weight management and 21% will refer the patient for Bariatric surgery if BMI>40 and another 26% will do so on patient's request. 77% will quote a figure between 1-30% risk of deep infection in obese patients (BMI>40) undergoing lower limb joint replacement. The median risk discussed was 5%. 6% respondents quoted 10% risk of deep infection reported in SCOT guidelines. 40% quoted the risk of amputation between 0.002 to 10% with a median risk of 1%. **Conclusions:** This survey highlights the variable practices. A standardised approach based on the guidance from SCOT committee may be beneficial for both surgeons and patients.



## Metallosis after Total Knee Arthroplasty – a rare entity

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**Introduction:** Metallosis is a rare syndrome in total knee arthroplasty(TKR), resulting from the deposition of metallic particles and ions in the surrounding tissues, which induce an inflammatory reaction leading to chronic synovitis and progressive osteolysis. **Materials:** We present 2 patients who underwent revision total knee replacement after presenting with pain and limited range-of-motion: an 81-year-old man with a 16-year TKR, and a 75-year-old woman with an 8-year TKR. **Results:** Extensive metallosis was observed intraoperatively in both patients. They underwent synovectomy and debridement of the involved tissues. Both underwent knee arthroplasty revision with a constrained hinge prosthesis. Postoperatively, the first patient ambulated with walking aids with joint range-of-motion overlapping the preoperative range and the second patient ambulated independently at 4 months without pain with range-of-motion improvement. **Discussion:** The main causes of TKP failure are infection, instability, aseptic loosening, and stiffness, with revision rates described between 2.2% and 5%. Metallosis results from metal-on-metal contact, which can occur with polyethylene wear. This interaction results in deposition of ions and particles leading to lymphocytic infiltration, phagocytosis of metallic particles by macrophages, and formation of giant cells in tissues. The resulting chronic inflammation causes osteolysis and prosthetic loosening. The release of metallic particles can even cause systemic toxicity and rarely even lead to the development of an Adjuvant-Induced Autoimmune/autoinflammatory Syndrome. **Conclusion:** Metallosis should be suspected in painful total knee prostheses and aseptic loosening of TKP with polyethylene wear, as early intervention may prevent the development of local and systemic complications.

## Severe knee osteoarthritis in rheumatoid arthritis, with bilateral flexion contracture: Difficult primary knee arthroplasty

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Total knee arthroplasty (TKA) is the most reliable solution for treatment of knee osteoarthritis. However, certain local or systemic conditions can pose a great risk for performing a primary TKA. Most common local conditions include previous surgery in the knee region, genu recurvatum, other severe deformities, recurrent patellar dislocations, ligament laxity, etc. Some systemic conditions such as cerebral palsy, SLE, RA and other connective tissue diseases can induce changes which can pose a significant challenge for the surgeon. These cases require careful analysis, extensive pre-operative planning and a systemic approach in treating and post-operative rehabilitation. In our presentation we are showing a 63 year old male patient with RA, and severe bilateral knee osteoarthrosis with flexion contractures. Upon primary admission the patient was unable to walk, with bilateral grade III flexion contracture. We performed a primary total knee arthroplasty of the left knee in November 2023. and after a period of intensive rehabilitation and physical therapy we operated the right knee in April 2024. After the early post-operative rehabilitative regime the patient is able to stand and walk on his own with a pair of crutches, with full ROM in both knees

## Is it mandatory to remove an intramedullary nail prior/during TKA?

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Implants and osteosynthesis material are increasingly being left in situ. If a tibial nail is present and a knee prosthesis is indicated, the nail is usually.

With good preoperative planning and appropriate patient information, this step can be (mostly) avoided.

We report on a 82 year old female patient scheduled for implantation of a TKA due to massive and symptomatic valgus gonarthrosis of the right knee. In 1965, the patient had a right-sided fracture of the lower leg treated with nail osteosynthesis; Due to the high risk of fracture in the event of metal removal, implantation was planned with the nail remaining in situ.

During preoperative prosthesis planning, it became clear that there was a high risk of implant contact. The patient consented to both options, leaving and removing the nail.

When preparing the proximal tibia, attention was paid to a slightly reduced slope due to the nail. With the correct cutting height, the implant passes the nail and the fin of the tibial implant lies behind the nail. Accordingly, metal removal was not performed. Further surgical procedure as usual.

The postoperative X-ray showed the extremely close positional relationship of the two tibial implants, without material contact or loss of results.

With appropriate conditions, good planning and an appropriately adapted surgical technique, a tibial nail can be left in situ with regard to knee prosthesis implantation. The risk of fracture due to metal removal can thus be omitted.

## When Pigmented Villonodular Synovitis Attacks

Afonso Nave<sup>1</sup>, António Serrano<sup>1</sup>, João Jesus Silva<sup>1</sup>, Nuno Matos Silva<sup>1</sup>, Sara Raposo<sup>1</sup>, Hugo Ribeiro<sup>1</sup>

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### Background

Pigmented villonodular synovitis (PVNS) is a rare and benign condition which has potential to be locally aggressive and has high recurrency rate. It is characterized by synovial proliferation and hemosiderin deposition inside the joints, tendon sheaths, and bursae. The etiology of PVNS is not known.

54 years old male, first consulted with a 7-year history of indolent growth of two masses on the left knee (anterolateral: 15x15cm; posterior 25x15cm). The patient reported rest pain which was aggravated by physical activity. The patient reported no fever, weight loss or loss of appetite. He had no prior medical history.

An MRI scan of the left knee showed a soft tissue mass with lobulated contours, with villous/nodular projections involving all the joint recesses and bone erosions.

The bone scintigraphy showed a pattern related to known villonodular synovitis of the left knee.

The patient was submitted to a two steps surgery. First, he underwent a sub-total synovectomy and a posterior approach to the knee joint, in which he underwent a sub total synovectomy.

The surgical team did not opt for adjuvant radiotherapy due to its side effects and the extension of the synovectomy performed.

Postoperatively, the patient was started on passive knee flexion and extension exercises and started proprioceptive weight-bearing on left knee. At the 1-year follow-up there were no signs of recurrence both clinically and radiologically, and he had full knee range of movement.

## Ultrasound-guided Treatment for Calcific Bursitis in the Medial Collateral Ligament of the knee : A Case Report

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### Background:

Calcific Bursitis commonly occurs in the shoulder; however, it is rare in the medial collateral ligament (MCL) of the knee. Ultrasound-guided percutaneous lavage (UGPL) is a well-established treatment for shoulder calcific bursitis, while there are few reports for the MCL of the knee.

### Objectives:

This case report demonstrates the efficacy of UGPL in treating calcific bursitis in the MCL of the knee.

### Methods:

An 84-year-old woman came to our hospital with main complaint of medial knee pain without a traumatic episode. Diagnostic imaging, including X-ray, ultrasound, and magnetic resonance (MR) examinations, confirmed the presence of calcific bursitis in the MCL. The patient underwent UGPL treatment, involving the injection of 0.5% lidocaine into and around the calcification site, followed by aspiration. Subsequently, 1ml triamcinolone was injected into the deep layer of the MCL. The entire procedure finished within 10 minutes, with little bleeding.

### Results:

After the UGPL treatment, the patient achieved immediate pain relief. Subsequent X-ray and ultrasound examinations conducted two weeks post-procedure revealed nearly complete absorption of the calcification. Furthermore, no obvious recurrence was observed three months after treatment.

### Conclusions:

This case report highlights the effectiveness of UGPL for calcific bursitis in the MCL of the knee as a minimally invasive procedure and successful treatment.

## Is Aspiration and Intra-Articular Injection of Tranexamic Acid Effective in Acute Knee Hemarthrosis of Adult Hemophilic Patients? A Randomized Clinical Trial Study.

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Although aspiration has been studied in acute hemarthrosis of hemophilia patients, the intra-articular injection of Tranexamic acid (TXA) has not been studied so far. This study aims to assess the efficacy of aspiration and intra-articular injection of TXA in adult hemophilia patients with acute (<24 hours) knee hemarthrosis. Thirty-seven hemophilia patients (>18 years) with acute hemarthrosis were enrolled from Tehran Imam Khomeini Hospital and randomly assigned into two groups. Following aspiration, the injection group (n=17) received 1.5grams TXA+ 74cc normal saline + 1cc lidocaine 2%, while non-injection group (n=21) received 1cc lidocaine 2%+ 74cc normal saline. Visual Analog Scale (VAS) and range of motion (ROM) were measured on days 3, 7, 14, 21, 28, 35, 42. Ethical approval was obtained from institutional review board. SPSS 26.0 was used for data analysis. Age, sex, hemophilia type/ severity, bleeding volume, and blood parameters revealed no significant differences between the two groups ( $p<0.05$ ). Bleeding rates and rebleeding incidence were comparable. ROM was not significantly different between both groups except on days 3, 7, and 14 with the injection group showing higher ROM. Injection group reported significantly lower pain scores, shorter pain durations, and quicker return to work compared to non-injection group ( $p<0.05$ ). Moreover, a higher percentage of injection group reported high satisfaction levels compared to non-injection group ( $p=0.02$ ). In conclusion, although intra-articular TXA injection following aspiration in acute hemarthrosis of adult hemophilia patients does not change the final knee ROM, it significantly reduces pain, quickens return to work, and enhances satisfaction.

## Dilemmas in diagnosing popliteal swellings: Nodular Fasciitis masquerading as Baker's Cyst

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This is a case of a popliteal swelling which was clinically misdiagnosed as a simple popliteal cyst, which turned out to be a benign fibroblastic tumour featuring nodular fasciitis. A swelling in the popliteal fossa by and large is considered to be a Baker's cyst. However, an array of other lesions which can be encountered like fibroma should also be borne in mind since clinical and radiological evaluation may not always be conclusive. This case report presents fibroma masquerading as Baker's cyst, which has not been described in any literature that the authors could find hitherto, making it a unique case. A twenty year old male gentleman presented to the outpatient department with a solitary palpable mass on the posterior aspect of right knee for the past three years associated with difficulty in squatting since three months. The mass gradually was well defined, increased gradually in size to the current size of 10\*9 cm, irregular soft to firm in consistency, spherical, non-tender, non-reducible on posterior aspect of popliteal fossa. Local ultrasonography showed evidence of heterogeneous hypoechoic lesion with signs of inflammation; underlying bony cortices appeared to be normal. A clinical diagnosis of Baker's cyst was made and an excisional biopsy was performed. Microscopically, histologic sections showed fibroblasts arranged in loose fascicular pattern intermixed with small amount of collagen and myxoid stroma. Popliteal masses need not always be simple Baker's cyst, and careful evaluation of the mass in the popliteal fossa is always mandatory.

## Enchondroma patella case report

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A 7 years old boy with a painful mass left knee and limitation of flexion. O/E a solitary multilobular hard mass , filling the suprapatellar pouch , attached to the patella , moves side to side & glides over the condyles in flexion till the pain of muscular pressure limits flexion to 90° and effusion. Imaging showed irregularity over the patella. through a midline incision. The cauliflower like bony cartilaginous mass measuring "7.5cm\*4.5cm\*3.0cm" was excised in-between stalk and upper pole of patella, the suprapatellar pouch was hypertrophied. Immediate full range of motion was regained as no fibrous adhesions were found. Biopsy revealed normal hypertrophic reactive synovitis probably due to mechanical irritation, and the bony growth as enchondroma, the patient was discharged the 10th day on quadriceps exercises and ice compresses , last follow up in two months full ROM.

DISCUSSION: Skeletal OCs constitute 10-15% of all bone tumors. OC arise in any bone that develops from endochondral ossification & patella through membranous ossification hence its rarity. Solitary OCs are usually metaphyseal, forming the typical pattern of stalactites and stalagmites. Our finding is against the proposed origin and initiation of the exostosis from a herniation and separation of fragment of epiphyseal plate giving the growth which stop growing with maturity as there is no epiphyseal plate in the patella. Our case is the first case in which the enchondroma is arising from the upper pole of patella with stalk , cauliflower growth unlike previous reported cases of patellar ones



## Repairing cartilage defects with the chondrocyte precursors might stop the progress of knee osteoarthritis – techniques and results

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**Introduction:** The cartilage defect, if not be treated, will be deepened and enlarged by cyclic motion of the knee which is believed up to 10,000 times a day. Chondrocyte precursors (CPs) were used to treat the defects. **Methods:** CPs embedded in atelocollagen were induced from autologous bone marrow stem cells. This surgical graft was implanted onto the grade 4 cartilage defect in the medial femoral condyle either through a mini-incision. **Results:** In the pilot study of 12 patients, the knee with severer symptoms of pain, click, limping and/or effusion was implanted with CPs. The contralateral knee was used as control. Nine years after operation, 9 patients still have good knee functions (IKDC score =  $69.8 \pm 12.3$ ) vs. the pre-implantation values ( $p$ -value = 0.0018). Followed by the about pilot study, a randomized controlled trial of 15 patients were stratified into experiment group with implantation of CPs ( $n = 10$ ) or control group with microfracture ( $n = 5$ ). Two years follow-up showed the knee function of CPs group significantly improved in the second year (IKDC =  $73.6 \pm 13.8$ ,  $p < 0.005$ ) vs. preoperative condition (IKDC =  $47.1 \pm 17.0$ ), while the control group with microfracture was  $52.6 \pm 16.4$ , not improved from previous IKDC ( $54.0 \pm 9.1$ ). No joint effusion, infection, loose body or tumor formation, or adhesion of the joint was noted in the CPs group. **Conclusion:** Based on the studies, we demonstrated that cartilage defect treated with CPs resulted in improved knee functions and without any complications.

## Osteochondritis dissecans in an adult: A case report

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**Introduction:** Osteochondritis dissecans (OCD) is a necrosis of the subchondral bone and overlying cartilage. This condition predominantly affects adolescents, particularly males, but in rare cases, it can be diagnosed in adults. In this report, we present a case of OCD in a 63-year-old woman.

**Observation:**

The patient presented with mechanical right knee pain following a closed trauma occurring 1 month prior. She experienced a limp while walking. On examination, the knee was dry and cool. There was evidence of medial meniscal syndrome without other abnormalities noted on the examination. Knee radiography revealed narrowing of the medial femoro-tibial joint space and a nodular image within a defect in the medial condyle classified as type IIa according to Bedouelle's classification. A long-leg radiograph showed a 3° varus alignment. MRI demonstrated a cystic lesion in the medial condyle, with mild T2 hyperintensity and T1 hypointensity, surrounded by a hypointense rim on T1, along with thickening of the articular cartilage, without evidence of fissure or detachment. The fragment measured 13 mm anteroposteriorly, 9 mm transversely, and 2.5 mm craniocaudally. The diagnosis of OCD was established, and the patient was scheduled for right knee unicompartmental arthroplasty.

**Conclusion:** In adults, osteochondritis dissecans (OCD) requires individualized treatment approaches due to its varied clinical presentations and complexities. Unicompartmental knee arthroplasty (UKA) in the context of osteochondritis dissecans (OCD) among adults with knee arthritis could be an effective surgical option.

## Blood Management and Pain Management During Primary Tourniquet-Less Total Knee Arthroplasty

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**Introduction:** Topical administering of tranexamic acid with local infiltration anesthesia (LIA) provide successful blood management and pain management after tourniquet-less primary total knee arthroplasty (TKA). **Methods:** Our retrospective study analysed data of 123 patients with primary OA of the knee that underwent tourniquet-less total knee arthroplasty. Patients were divided in three groups: I (operated during 2014.) and III (operated during 2018.) group that received topical 1.0 g TXA, II (during 2014.) group that did not receive TXA. All patients received LIA. Hemoglobin (Hb) was measured three times: firstly, before surgery (within two weeks of date of surgery – preoperative measure); secondly, on “the first postoperative day” (IPD), and thirdly, on “the third postoperative day” (IIIPD). Total amount of substituted blood was also measured. The post-operative pain of knee was evaluated by a visual analogue scale (VAS) scoring system the first and the third day. **Results:** Hb measured on IIIPD was with significant statistical difference between I and II, II and III groups ( $p < 0.05$ ) and no statistically significant difference between I and III groups. VAS scoring system was with significant statistical difference between I and II, I and III, and II and III groups ( $p < 0.05$ ) on IPD, and between I and III group on IIIPD ( $p < 0.05$ ). **Conclusion:** Our study showed that use of topical one gram of TXA with LIA resulted in significant reduction in postoperative blood loss and transfusion values during tourniquet-less primary total knee arthroplasty and successful pain control. **Key words:** TXA, LIA, blood management, pain management, tourniquet-less TKA

## What causes Patellofemoral pain? Exploring the lower limb Biomechanics.

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Background: Patellofemoral pain syndrome (PFPS) is a common condition but its aetiology is still unclear. This study aimed to analyse the lower limb biomechanics and compare the hamstring length, Q angle, hip muscle strength and foot parameters in adults with and without PFPS. Methods: 89 subjects aged 18-45 participated in the study (44 subjects and 45 age-matched controls). Popliteal and Q angles were measured using a 360° handheld goniometer. Navicular Drop was measured using a ruler. Navicular drift was measured using a custom-made metal slat. Foot posture index was assessed using an FPI-6 chart. All measurements were made by a single blinded examiner and the results were assessed by the authors for statistical significance ( $p < 0.05$ ). Results: No significant differences were found in all of the demographic profiles in subjects with PFPS as compared to control subjects ( $p$ -value  $> 0.05$ ). The case subjects had decreased hamstring length as compared to controls, with mean values of 168.39 and 174.58, respectively ( $p = 0.002$ ). Q-angle was found to be higher in patients ( $p$ -value: 0.001), with a mean value of 15.92 against a mean of 14.2 in the controls. FPI was significantly different ( $p = 0.001$ ) in cases (3.03) than controls (1.82). Hip muscle strength, navicular drop, and navicular drift did not differ significantly in the two groups. Conclusions: Lower-limb biomechanical factors vary significantly in patients with PFPS. Hamstring length was shorter, Q angle increased and foot posture index was higher in cases pointing to their association with PFPS.

## Effect of Topically Administered Tranexamic Acid on Early Postoperative Infections after Total Knee Arthroplasty: A Registry Analysis

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The growing utilization of intravenous (IV) Tranexamic Acid (TXA) in surgical procedures has underscored its association with a lower incidence of postoperative surgical site infections and periprosthetic joint infections. This correlation can be attributed to reduced perioperative allogenic blood transfusion needs and enhanced skin wound healing. Given the comparable effectiveness of topically administered TXA to IV use, alongside its potential bacteriostatic effects due to higher local concentrations, our study aimed to explore the relationship between topically administered TXA and early postoperative infections (EPI) following total knee arthroplasty (TKA).

Conducting a single-center retrospective observational study, we analyzed patients undergoing primary cemented TKA from 2014 to 2020, excluding those with prior joint infections, adverse surgical events, or a BMI exceeding 35. Out of 12,309 TKAs, 3,081 (2722 patients; 1621 women, 1101 men) met inclusion criteria. EPI diagnosed within 3 months after TKA, requiring antibiotic or surgical intervention, occurred in 15 patients (0.5%), of which 3 received only local TXA, 3 received only IV TXA and 2 of them received both local and IV TXA. Statistical analysis did not reveal a significant association between local and/or IV TXA administration and EPI, however perioperative transfusion ( $p=0,022$ ) and surgery duration ( $p<0,05$ ) emerged as significant risk factors for EPI.

In our analysis the topical use of TXA in TKA did not demonstrate a significant protective local effect against EPI. Furthermore, results did not prove consistent with the conclusions of previous studies on IV TXA, failing to demonstrate a correlation between IV TXA and EPI after TKA.

## Distal femoral flexion type osteotomy for acquired genu recurvatum deformity: Remembering of an old technique

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introduction: acquired genu recurvatum (GR) is a complex and debilitating deformity. Posttraumatic conditions and neuromuscular diseases are the most common causes. We aimed to present satisfactory results of an old osteotomy technique in two cases with severe GR deformity. case presentation: the first case was a 56-year-old man, who had recurvatum as a sequela of poliomyelitis. physical examination revealed 30° of hyperextension in the right knee. radiographs showed 30° of recurvatum, and 12° of tibial slope angles. the second case was a 48-year-old female who had recurvatum secondary to right knee trauma. she had been undergone surgery including soft tissue repair and proximal tibial osteotomy 7 years before the presentation. physical examination revealed valgus laxity besides 20° of hyperextension. recurvatum and tibial slope angles were 25° and 26°, respectively. both patients were operated by using lateral incision. an oblique osteotomy was performed on the distal diaphyseal-metaphyseal junction and distal part of osteotomy was angled in flexion while invaginated into the proximal part. the osteotomy gap was filled by autogenous graft and fixed with titanium anatomic locked plate. additional medial collateral ligament repair was applied in the female patient. postoperatively, patients used an adjustable knee brace and started knee exercises. weight-bearing was avoided for six weeks. they were allowed full weight-bearing at 3 months postoperatively. at the end of the first-year follow-up, patients could walk independently without pain. conclusion: in cases with poliomyelitis or recurrence of GR, distal femoral flexion type osteotomy shows satisfactory radiologic and clinical outcomes without any complications.

## Medial Subtraction High Tibial Osteotomy (HTO) for Tibial Valgus Deformity Correction: Case Report and Brief Review of the Literature

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In the past years, knee osteotomies have been proposed as an adjunct procedure in case of ligament insufficiency or cartilage lesion, to unload the affected compartment when a knee deformity is present. The authors report a 39-year-old female patient referred to orthopedic consultation due to ongoing lateral mechanical knee pain, after right knee sprain. Tenderness on lateral interline and positive McMurray test for lateral meniscus were evident. Neither ligament instabilities nor patellofemoral abnormalities were found. Normal range of motion was maintained. Long-leg standing weight-bearing, weight bearing AP and lateral knee x-ray and MRI were undertaken. X-rays showed severe global valgus deformity on the affected side comparing to the contralateral (anatomical tibiofemoral angle 15.81° vs 9.43°), with the major deformity caused by a tibial valgus (mLDFA 84.95, mMPTA 96.06), associated with a normal joint line convergence angle (JLCA = 0,26° varus). MRI revealed anterior lateral meniscus fracture with associated grade II/III tibial and femoral chondral lesions. An arthroscopic lateral partial meniscectomy followed by a medial closing wedge HTO (with plate and screws fixation) were performed at the same surgical time. Pre- and post-operative Oxford Knee Score, Lysholm Knee Questionnaire and Tegner Activity Scale were registered. There were significant symptomatic and functional improvements. A satisfactory axial alignment was obtained. There were no HTO-related complications. Varus-producing HTO is a reliable tool in the treatment of valgus knee. It allows for the correction of flexion and extension axial alignment while effectively unloading the lateral compartment, especially when lateral meniscus or chondral lesions are present.

## A pendular form of PVNS

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**Introduction:** A group of benign neoplasms such as villonodular synovitis and synovial giant cell tumors combined with bursitis and tenosynovitis, are categorized histologically by lipids, proliferating histiocytes, fibrous stroma, hemosiderin, pigment deposition, and multinuclear giant cells with various distribution and localization in the joint. This fuzziness in terminology prolonged the uncertainty in making the diagnosis. Having that in mind, these groups of diseases can be subdivided into diffuse or localized types presented as a limited, solitary mass of either pedunculated or, less commonly, a sessile nodular of the synovial membrane. **Methods:** We are presenting the male 50 years of age, admitted to our department with pain and swelling of the knee with trauma one month before. There were no palpable masses during the clinical examination but the range of motion was between 0° and 130°. MRI of the knee was done and due to the suitable size of solitary formation and its localization that enabled arthroscopic access, it was decided to perform the procedure arthroscopically with the achievement of clear margins and PVNS was histopathologically proven but classified as diffuse type as opposed to MRI findings. **Results:** We recommended a control MRI in 3 months according to the diffuse type of histologic diagnosis. The anatomic and clinical presentations and obvious biological behaviors underlie the difficulty of therapeutic management. And contrary to histologic confirmation we should take care about follow-up.



## AMIC Treatment For Large Chondral Patellar Defect In A Middle-Aged Runner's Knee - A Case Report

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Case: The authors present a 50-year-old woman, cross-country runner, with knee pain and joint locking after falling in 2021. She presented a claudicating gait and pain in the medial femorotibial and patellofemoral joint lines, with range of motion limitation. The MRI showed a large complete thickness lesion located in the medial patella facet. A mini medial parapatellar approach was used. A grade IV chondral lesion was found on the medial patella facet, measuring 20x20mm. The AMIC technique, associated with microfractures, was used. Fibrin glue and a collagen membrane were then applied. The graft stability was checked with passive knee mobilization. Outcomes: At six months, the flexion improved to 135° and running was tolerated two times a week. Discussion: Compared to microfractures, the AMIC technique was shown to be superior in the treatment of focal chondral lesions larger than 2.5cm<sup>2</sup>, with better outcomes at 2 and 5 years post-op. In the case presented, the patient began short distance running at five months post-op, with substantial knee flexion improvement at six months post-op, proving that this surgical strategy should be considered in this type of chondral lesions

## Osteoarthritis: New Treatment, New Hope.

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**Introduction:** Osteoarthritis, one of the leading causes of disability in elderly population is a progressive degenerative disease of articular cartilage, leading to joint pain, stiffness, and impaired mobility. Conventional treatment modalities only provide symptomatic relief but fails to limit the natural course of disease. PRP (Platelet Rich Plasma) can relief symptoms and restore joint.

**Background:** Autologous PRP is obtained by centrifuging patient's own blood. The centrifuge machine separates the blood into three main layers based on density: red blood cells (RBCs), platelet-rich plasma (PRP), platelet-poor plasma (PPP). PRP is then carefully collected from the second layer. Platelets contain growth factors that stimulate tissue repair and regeneration. When administered intra-articularly, these growth factors repair and regenerate degenerated articular cartilage by stimulating chondrocyte proliferation.

**Aims:** Being a comparatively new treatment option, research related its efficacy is fewer. Still, analysis of the available literatures show the positive impact of PRP on pain reduction and functional improvement in osteoarthritis.

**Method:** A comprehensive search for relevant database was conducted to identify the effect of PRP on osteoarthritis. We administer PRP injection for stage 1-3 osteoarthritis, showcasing radiologic evidence depicting increased joint space. In stage 4 osteoarthritis, we enhance it by incorporating laser puncture techniques. The combined approach results in improved clinical outcome and radiological evidence.

**Conclusion:** More research are going on regarding the role of PRP on osteoarthritis. The natural healing property of PRP has the ability to reverse the damage and degeneration of articular cartilage, causing alleviation of symptoms and reparation the affected joints.

## Gold-induced cytokine (GOLDIC®) therapy in the management of knee osteoarthritis – An observational study

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**Introduction:** Current treatment modalities for knee osteoarthritis (OA) provide symptomatic cures rather than reversing the pathology in the long term. An innovative regenerative therapy called “Gold Induced Cytokines” (GOLDIC) was explored in various musculoskeletal diseases. In this study, we explored the safety and functional outcome of GOLDIC injections in knee OA (KL grade 3 and 4) with VAS and WOMAC scores. **Materials and methods:** An open-label prospective trial was carried out, after screening the cases, according to the inclusion criteria. A total of 106 knees in 65 patients were enrolled for 4 doses of 4 ml of ultrasound guided intra-articular GOLDIC injections every three to six days. All cases were followed up with pre- and post-VAS and WOMAC scores at an interval of 4 weeks, 3 & 6 months and one year, and the complications were monitored throughout. **Results:** In this study, 66.1% had Grade 4 OA knee (without gross varus or subluxation) and 33.8% had Grade 3 OA knee. All the participants underwent the GOLDIC treatment modality. Statistically significant difference was observed in pre- and post-procedural follow-up in VAS and WOMAC scores at one year follow up. There were no recorded SAEs during the entire study period. Three patients failed the treatment at one year. **Conclusion:** The GOLDIC® procedure shows great promise as a novel method for treating moderate to severe OA of the knee both in terms of pain and functional outcome without any SAEs, in a sustained manner and is worth exploring as a long-term treatment option.

## Efficacy of Stromal Vascular Fraction Compared to Corticosteroids for Knee Osteoarthritis: A Prospective, Single-Centre, Non-Randomized Study with 3 years Follow-up

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**Introduction:** In regenerative medicine, current treatments have limitations. In regenerative medicine, more research is needed for intra-articular SVF injections in OA, including dosage optimization, long-term efficacy, safety, comparisons with other treatments, and mechanism exploration. The goal of this study was to compare the efficacy of intra-articular SVF with corticosteroid (ICS) injections in patients with primary knee OA. **Materials and methods:** The study included 50 patients with Kellgren-Lawrence (KL) grades II and III OA. Patients were randomly assigned (1:1) to receive either a single intra-articular SVF injection (group A) or a single intra-articular ICS (triamcinolone) (group B) injection. Patients were followed up at 1, 3, 6, 12, 24, and 36 months. VAS and IKDC scores were administered before the procedure and at all follow-ups. **Results:** Group A experienced a notable reduction in pain, with Visual Analog Scale (VAS) scores decreasing from 7.7 to 2.4 over 36 months, compared to a minor reduction from 7.8 to 6.2 in Group B. This difference in pain reduction in group A was statistically significant from the third month onwards. Additionally, Group A showed significant improvements in knee functionality, with IKDC scores rising from 33.4 to 83.10, whereas Group B saw a modest increase from 36.7 to 45.16. The improvement in Group A was statistically significant from 6 months and maintained through 36 months. **Conclusion:** Our study demonstrated that intra-articular administration of SVF can lead to reduced pain and improved knee function in patients with primary knee OA.

## Role of platelet-rich plasma in knee osteoarthritis: Early results of 190 patients in a tertiary centre.

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Knee pain has been the primary cause of decreased activity in the 5th or 6th decade of life. Over the years, degenerative osteoarthritis has been the primary cause of knee pain. Though knee arthroplasty has been the final management, different conservative approaches have been adopted to delay the progression of knee arthritis. Platelet-rich plasma (PRP) is one of the recent advances in the management of knee osteoarthritis. We present our short-term outcome of three PRP shots in 190 knees. Only KL grade II and III were included in the study. VAS, Oxford knee score, patient eagerness for the subsequent doses and referring the procedure to their first-hand relative were evaluated. Anxiety about prick pain was the major concern in 30% of patients. Pain relief with the first shot motivated the patients for the subsequent doses. After three months of the last shot, pain relief in terms of VAS and Oxford knee score was encouraging. Two patients had acute inflammation with swelling and stiffness of the knee, which was managed with knee immobiliser, ice compression, and NSAID. After the subsidence of swelling, both patients had the remaining two shots. All patients had agreed to refer the treatment to their first-hand relatives. How far the knee arthroplasty can be deferred is difficult to answer, but improvement of VAS from the baseline was 40% to 100%, and improvement of Oxford knee score was more than 40 % in all patients. All patients had better subjective knee function with three shots of PRP.

## Correction Of Severe Angular Knee Deformity After Failed Limb Lengthening Surgery For An Achondroplasia Patient

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**Introduction:** The biomechanical function of the joint is reliant on the alignment of the lower extremity. Limb deformity results in abnormal transmission of forces, predisposing to various joint pathologies. **Case Presentation:** 31-year-old male, referred to our institution with a painful severe varus left knee deformity. He had a past medical history of achondroplasia, medial hemiepiphysiodesis for genu valgum, and gradual limb lengthening of both femurs with external fixator. The medial proximal tibial angle (MPTA) of the left knee was 73°, the center of rotation and angulation (CORA) of the deformity was located within the proximal tibia and there was a limb length discrepancy of 1.5cm, with the left femur being 2cm larger and the left tibia 0.5cm shorter when compared with the contralateral limb. The patient underwent surgical treatment: step-cut femoral shortening osteotomy and fixation with antegrade nail, combined with medial opening wedge tibial (MOW) osteotomy and fixation with medial plate. **Discussion:** Although the deformed left limb was overall larger and needed to be shortened, the left tibia was 0.5 cm shorter than the contralateral one. For that reason, we opted for a MOW, instead of a lateral closing wedge, to avoid further shortening of the tibia. We then proceed to correct the limb length discrepancy by shortening the femur with a step-cut femoral shortening osteotomy. The most common alternative to HTO is medial unicompartmental knee arthroplasty. However, in the presence of a severe deformity with an MPTA of 73°, arthroplasty alone couldn't correct the patient's mechanical axis.

## Intra-Articular Injection of Secretome Derived from Umbilical Cord Mesenchymal Stem Cell Effect on Enhancing Regeneration Process of Cartilage in Early-Stage Osteoarthritis: An Animal Study

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Mesenchymal stem cell (MSC) has the capacity to proliferate into chondrocytes and create secretome that influences the cellular environment. Secretome, an MSC derivate, has also been shown to provide this mechanism through the paracrine effect. We aimed to analyze the efficacy of intraarticular injections of hyaluronic acid, MSC, and secretome on cartilage change in animal model. We included 19 (1 as control) male sheep (*Ovis aries*) operated with total lateral meniscectomy to induce knee OA. All 18 sheep were randomized into 3 groups: the secretome, hyaluronic acid, and MSC groups. Each group was injected with 2 mL of secretome, 2 mL of hyaluronic acid, or  $2 \times 10^6$  cells of UC-MSC. The sheep were observed for 1 month; then, the cartilage was evaluated macroscopically and microscopically. Osteoarthritis Research Society International (OARSI) score was calculated for all subjects as well as descriptive and comparative statistical analysis. The results showed that the secretome group had a significantly better total macroscopic OARSI score (6.8, SD 1.5) compared to the other 2 groups ( $p < 0.05$ ) and a significantly better microscopic score compared to the hyaluronic acid group (mean difference 6.0, 95% confidence interval 0.15–12,  $p < 0.05$ ). The structure score ( $p = 0.03$ ) and the interterritorial score ( $p = 0.007$ ) showed significant differences among the 3 groups. In conclusion, intraarticular injection of secretome is more effective in managing the early stage of osteoarthritis in the animal model compared to hyaluronic acid and has similar efficacy with MSC injection.

## Chondrosarcoma around the knee: conservative management

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Low-grade chondrosarcomas of long bones represent a rare but clinically significant entity, slow and often insidious. Their therapeutic management is a challenge because the need to reconcile effective treatment while preserving the patient's functionality and quality of life. We present a case illustrating the complexity of this pathology and the relevance of a conservative therapeutic approach.

We present the case of a 61-year-old man with progressive installation knee pain evolving since one year in contrast to medical treatment, associated with swelling of the antero-internal side of the knee.

X-rays show an osteolytic image, heterogeneous with intralesional calcifications located in the proximal metaphyseal part of the tibia. MRI affirmed the cartilaginous nature of the matrix. Biopsy was done showing an aspect of well differentiated low grade chondrosarcoma.

We chose a conservative approach with tumor resection and bone and extensor reconstruction. The surgery consisted of a resection of the tumor mass carrying 3/4 of the patellar tendon and tibial tuberosity; Subsequently the reconstruction of the bone defect was done using an iliac bone graft, and the restoration of the extensor system by a hamstring graft. Post-operative results were favourable, allowing walking without stigma of recurrence until the last 3-year follow-up.

In this particular case, the conservative approach has demonstrated its effectiveness, offering favourable results with satisfactory recovery of locomotor function, without long-term recurrence.

This therapeutic strategy represents

a promising alternative in the management of low-grade chondrosarcomas of long bones.



## Use of Internal Bracing in Multi Ligamentous Knee Injury Reconstruction: A Systematic Review

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Surgical reconstruction of multi-ligamentous knee injuries (MLKI's) is considered the gold standard intervention despite failure remaining high. This study is the systematic appraisal of the literature relating to the efficacy of internal bracing in the surgical management of these injuries. Methods: EMBASE, CINAHL AND Medline databases were searched for all appropriate literature. Studies were screened according to PRISMA protocols. Relevant data was extracted from included studies. In total 13 studies from the original 282 retrieved were included. Clinical outcomes relating to failure, revision surgery and PROMS were recorded. Results: Failure rates ranged from 0-13.6%. Lysholm score was the most commonly utilised PROMS tool with scores ranging from 61.8-95. All studies demonstrated clinically significant improvement in PROMS  $p < 0.05$  where pre and post op scores were recorded. Further surgery was required in between 12-20% of cases with MUA for stiffness common. No adverse effects of internal bracing were recorded. Clinical assessment comparing braced and non-braced knees indicated improved knee stability and accelerated rehabilitation. Conclusion: Internal bracing is a well tolerated intervention in the management of MLKI. Its use has been associated with reduced failure rates and accelerated recovery with few adverse features. However, the high variability in these injuries led to high levels of heterogeneity both within and between the studies. Further studies assessing this novel technique are required before its widespread adoption.

## Mid Term outcomes of Internal bracing in the surgical management of ACL injuries.

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**Aim:** ACL reconstruction (ACL-R) fails in upto a third of patients. High re-rupture rates, variable outcomes and an improved understanding of the modes of failure has led to an evolution in strategies to augment ACL reconstruction. This study sought to evaluate 517 patients who had undergone internal bracing along side routine hamstring allograft/autograft ACL reconstruction. **Methods:** All skeletally mature patients under 30 undergoing ACL-R with a minimum of 24 month follow up were included. 2 cohorts were analysed to indicate the efficacy of each iteration of augmentation. Group 1 = first generation internal bracing, group 2 = Second Generation Internal bracing. The primary outcome measure was clinical recurrence of symptoms, secondary outcome measures included tegner scores and secondary injury to the knee. **Results:** A total of 517 cases met the inclusion criteria. The main outcome measure was met in 23 / 280 (8.4%) patients in group 1, 12 / 237 (5.06%) patients in Group 2. Secondary injury was noted to be 9 and 10 two groups respectively. Statistically fewer patients in group 2 achieved the primary end point than those in group 1 (fisher exact  $p < 0.05$ ). The tegner activity scale demonstrated clinically significant improvement in function in patients undergoing second generation internal bracing when compared to those undergoing generation 1 internal bracing  $p < 0.05$  (ANOVA). **Conclusion.** The addition of second generation internal bracing to augment ACL-R has led to clinically significant improvement in outcomes at 2 years follow up. Improvements may well be due to enhanced recovery and stress shielding.

## Patelofemoral dislocation – a rare presentation

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Osteochondral fractures with MPFL avulsion in pediatric patients represent a rare presentation of patellofemoral dislocation. These injuries can have significant implications for affected individuals, particularly in terms of biomechanical stability, function, and potential future complications. The biomechanical integrity of the patellofemoral joint relies on the stabilizing influence of the MPFL, which acts as the primary passive restraint against lateral patellar dislocation. Osteochondral fractures due to instability and fracture displacement are typically treated with ORIF, but proper treatment of the MPFL is not consensual. Therefore treatment depends on surgeon expertise - bioimplant screws, arthroscopic fragment fixation, MPFL reinsertion, or reconstruction. We present a case of a 12-year-old girl with an acute knee sprain resulting in an osteochondral fracture with MPFL avulsion. Prompt recognition and appropriate management were crucial to minimize the risk of long-term sequelae. Surgical intervention involving open reduction and internal fixation of the osteochondral fragment, along with MPFL reinsertion using bioimplant screws, facilitated anatomical restoration and joint stability. Postoperative rehabilitation with partial weight-bearing and orthotic support aimed to optimize functional recovery while minimizing complications. Despite advancements in surgical techniques and rehabilitation protocols, complications following the management of osteochondral fractures with MPFL avulsion in pediatric patients can occur. This is a very rare case not reported in the literature. We want to increase awareness about fractures with possible avulsion of the MPFL of OCF – without guidelines, we performed an MRI that reported this ligament lesion; otherwise, if we only fixed the fragment, the joint would remain unstable.

## Bilateral neglected rupture of the quadriceps tendon in kidney failure

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### Introduction:

Considered rare, chronic ruptures of the quadriceps tendon have been the subject of few studies, and their management is not yet standardized.

### Patient and methods:

This concerned a 55-year-old patient with an end-stage chronic renal failure, who consulted for total functional impairment of both lower limbs following minor neglected trauma for 6 months. Clinical examination revealed an absolute deficit in active knee extension, a suprapatellar gap. Radiography showed bilateral patella baja. MRI revealed bilateral quadriceps tendon rupture, with retraction of the proximal end of the tendon. Surgical treatment consisted of transosseous reinsertion, followed by reinforcement with the semitendinosus and gracilis tendons. Both knees were immobilized with knee braces for 3 weeks, followed by functional rehabilitation.

### Discussion:

Tendon rupture is attributed to two main pathophysiological hypotheses: degenerative tendon remodeling related to chronic acidosis and erosive enthesiopathy related to hyperparathyroidism. However, the exact pathogenesis of tendon rupture in hemodialysis patients is not yet elucidated. In chronic renal failure, the level of 1,25-dihydroxyvitamin D3 decreases due to disruption of the hydroxylation of 25-hydroxyvitamin D3 in the kidney, leading to decreased intestinal calcium absorption and consequently hypocalcemia. The latter increases parathyroid hormone secretion, which stimulates bone resorption at the osteotendinous insertion. It is highly likely that secondary hyperparathyroidism leads to bone resorption at the tendon insertion.

### Conclusion:

Spontaneous and simultaneous bilateral ruptures of the quadriceps tendon are exceptional. They should not be overlooked because the treatment of an inveterate lesion is more difficult and the outcome more uncertain.

## Distal Femoral Juxta Articular Bone Loss Treated by Bone Transport- A Retrospective Study

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AIM: To present the results of fifty patients with traumatic distal femoral bone loss who were treated with bone transport with Ilizarov ring fixator .MATERIAL & METHODS: Fifty patients were retrospectively studied. The mean age was 35.2 yrs. All injuries occurred in the distal 1/3 of the femur at the supracondylar and inter condylar region . There were 47 males and 3 female patients . The mean bone defect was 5.7 centimeters. Infection was present in 30 cases. The frame was extended across the knee in forty three cases. RESULTS: The average period in ring fixator was 13.8 months. Two patients were lost to follow up. Union on frame removal was seen in forty six patients. Twenty two patients had a stiff knee while remaining patients had varying degrees of knee flexion ranging from 10 to 110 degrees. There were other complications including extension lag, recurvatum deformity, re-fracture, premature consolidation of Corticotomy, persisting infection, shortening and non- union. Forty three returned to their old occupations. CONCLUSION: In distal femur injuries with bone loss especially with infection bone transport with Ilizarov ring fixation gives good results in spite of complications

## Inferior intra-articular patellar dislocation in elderly patient, reduced using a minimally invasive technique.

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**Background:** Patellar dislocation is a common condition in young people representing 3% of knee injuries. Intra-articular patellar dislocation is a rare condition where the patella dislocates either in the horizontal or vertical planes. The commonest type of these rare intra-articular dislocations is inferior horizontal type where patella rotates 90 degrees facing distally. The current evidence suggested the main treatment of such injury to be closed reduction, however, other studies clarified the possible risks and complications of this treatment and the need for operative intervention in irreducible cases. **Aim and Methods:** In this presentation, we report a case of inferior patellar dislocation in 80 years old patient that was irreducible by closed measures, and reduction was done using a genuinely described minimally invasive technique via the standard incision for the knee arthroscopy anteromedial portal. **Results and conclusion:** Minimally invasive technique under image screen can be successfully used rather than full open knee approach or arthroscopy to decrease the possibility of infection and improve post-operative rehabilitation. We recommend this technique to be used only after trial of closed reduction under proper sedation and muscle relaxants

## Medial Collateral Ligament and Posterior Oblique Ligament Reconstruction with Semitendinous Autograft for Treatment of Grade II Isolated MCL tears. Case Report.

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**Introduction:** The medial collateral ligament (MCL) complex of the knee is a primary stabilizer of the joint. MCL tears are rare and frequently associated with other articular lesions. The treatment of isolated MCL injuries is controversial. Grade II and III isolated tears, due to their cicatricial potential, usually are managed conservatively, surgical repair is indicated in chronic lesions or failure of conservative treatment. **Methods:** Case report. 48 years old female patient, with a chronic Grade II MCL tear (>50% of proximal insertion) with 5 months of evolution with failure of conservative treatment. The patient was submitted to a diagnosis arthroscopy and to a MCL and POL reconstruction with semi-tendinous (ST) autograft with Weaver technique. Ipsilateral ST was harvest maintaining his distal insertion, first, the graft was trespassed through the MCL and passed under the fascia to the medial epicondyle over the MCL path. Proximally was fixed in a femoral tunnel with an interference screw. The graft was passed under the fascia and fixed with a tibial tunnel and interference screw near the distal insertion of the POL. **Results:** There were no intra or postoperative complications. 1 year follow-up the patient reports an improvement of joint stability and shows a similar range of motion and extension strength when compared to the contralateral knee. She performs full weight bearing without limitations. **Conclusion:** There is controversy regarding surgical treatment of MCL isolated tear. In isolated chronic, grade II isolated tear the MCL and POL reconstruction with ST is a safe and effective technique.

## Repair of total tear of the knee extensor mechanism with autologous graft. Case reports.

Joao Manuel De Jesus Silva<sup>1</sup>, Antonio Serrano<sup>1</sup>, Nuno Matos Silva<sup>1</sup>, Afonso Nave<sup>1</sup>, Sara Raposo<sup>1</sup>, Luis Sobral<sup>1</sup>, Hugo Marques Ribeiro<sup>1</sup>

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**Introduction:** Total tears of patellar and quadriceps tendons are rare, but if left untreated can lead to an important functional deficit. Acute tears repair should be performed as soon as possible. Chronic tears repair is more challenging due to poor tissue and tendinous retraction. In both type of lesions augmentation techniques have been advocated. **Methods:** 2 patients with total tear of knee extensor mechanism submitted to repair with augmentation with semitendinous tendon (ST) autologous graft. 56 year old male patient with a chronic total traumatic tear of the distal insertion of the quadriceps tendon. Repair was performed with suture anchors and ST autologous graft augmentation through a transverse patellar osseous tunnel. 26 year old male patient with a mid-substance traumatic acute tear of the patellar tendon. Repair was performed with end-to-end krackow sutures and ST autologous augmentation in U shape through a transverse tibial tuberosity tunnel and bilateral proximal fixation with retinaculum tunnels. **Results:** Both patients at 1 year follow-up returned to their previous activities and show no range of motion or extensor lag when compared to the contralateral knee. **Discussion:** There aren't high evidence level studies regarding this lesions repair. Similarly to previously reported cases the repair of these lesions with augmentation is safe and allowed a faster rehabilitation. **Conclusion:** The repair of total extensor mechanism tears with augmentation is safe and allows a faster rehabilitation.



## The Effect of Intraarticular Tranexamic Acid on Pain and Functional Outcomes Following Arthroscopic Anterior Cruciate Ligament Reconstruction: A Randomized Controlled Trial

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**Introduction:** We aimed to evaluate the effect of intraarticular tranexamic acid (TXA) injection on pain and functional outcomes after arthroscopic anterior cruciate ligament reconstruction (ACLR).

**Methods:** This prospective, randomized, controlled trial was conducted on 102 patients undergoing arthroscopic ACLR, randomly assigned to intervention or control group, with 51 participants in each group. The intervention group received intraarticular TXA (1gr) immediately after arthroscopy. Both groups received ketorolac (30mg) and morphine (5mg) injections. Age, sex, laterality, American Society of Anaesthesiologists physical status, surgery time, tourniquet time, injury pattern, injury to surgery interval, graft choice, and comorbidities were evaluated. Knee Injury and Osteoarthritis Outcome Score (KOOS) was assessed preoperatively and at one and three months. Lysholm score was evaluated preoperatively, at one week, one month, and three months. The visual analog scale (VAS) was assessed at 1, 2, 3, 6, and 12 hours, one week, one month, and three months. Range of motion (ROM), malleolar and knee circumference, and quadriceps femoris force were evaluated preoperatively and at three months. **Results:** The demographics, baseline VAS, KOOS, Lysholm score, ROM, quadriceps femoris force, and malleolar and knee circumference were comparable between the groups ( $P>0.05$ ). KOOS, Lysholm score, VAS, ROM, malleolar and knee circumference, and quadriceps femoris force were not significantly different between the groups at any time point ( $P>0.05$ ). No complication was observed, including infection, thrombosis, or nerve damage.

**Conclusion:** TXA does not benefit patients in alleviating pain or improving functional outcomes after arthroscopic ACLR. We suggest investigating long-term results with different doses of TXA.

## Avulsion fracture of the anterior tibial tuberosity in children: A report of 8 cases

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**Introduction:** Fractures of the anterior tibial tuberosity are rare in children. They are mostly seen in adolescent aged between 13 and 16 years old. The aim of this study is to better understand the mechanisms of these fractures and to assess the long-term outcomes of different therapeutic options.

**Patients and Methods:** This is a retrospective study conducted on 8 children who presented with an avulsion fracture of the anterior tibial tuberosity over a period of 7 years, from 2016 to 2022, at the pediatric orthopedic and trauma department. The radiologically, to evaluate displacement we used the classification of Watson-Jones modified by Ogden.

**Results:** The mean age of our patients was 12.6 years. The circumstances of the trauma for all patients were sports-related accidents. The tibial tuberosity fracture was isolated in all patients, it was non-displaced (stage IA) in 3 cases treated orthopedically, and displaced in the other 5 cases requiring osteosynthesis: two screws with washer for stage IIB fracture, and a single screw with washer for stage IB fracture. Immobilization was maintained for an average of 6 weeks. The functional outcome was excellent in all our patients after a minimum of 12 months follow-up.

**Conclusion:** The circumstances and mechanisms of anterior tibial tuberosity fractures are stereotyped and should guide diagnosis. The functional prognosis of the knee depends mainly on associated injuries.

## Hoffa Frature as a complication of Total Hip Replacement a rare relation

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Clinical case of a 71-year-old female patient. She underwent elective total left hip replacement surgery ( Moore approach) outside of our institution . In the immediate post-operative period, she reported pain in her left knee, with no history of trauma. Due to suspicion of DVT, she underwent 2 doopler tests on the left lower limb, which were always negative for any embolic event. She was discharged home after 10 days of hospitalization without the ability to walk with load on the operated limb. She was admitted to our center due to continued pain and inability to walk. Complementary diagnostic tests were carried out and diagnosed with a sagittal fracture of the medial femoral condyle with misalignment of the bone tops. She was admitted for surgical treatment on at our center with a diagnosis of type 3 Hoffa fracture. She underwent open reduction and internal fixation with 2 reconstruction plates 4.0 (1 anti-glide fashion ) via the posteromedial approach of the distal femur. The patient was discharged at the end of the 5th day after surgery. Walking with unloading of the operated limb and controlled pain. It was evaluated at 2, 6, 12 and 24 weeks. Always maintained reduction and start of full load after 8 weeks. Currently, she has a joint range of 0°-90° and walks without complaints on the knee. Sometimes the mechanism does not fit with the fracture. To the best of our knowledge there is no other cases like this in the literature.

## Lobenhoffer approach and Prone decubitus - elected choice in treatment of tibial plateau fractures with posteromedial fragment

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The posteromedial(PM) approach of the knee with the patient in the prone position(PP) is a safe approach compared to other approaches. The aim of this study is to characterize the results obtained in treatment of patients with plateau fractures involving PM column. A Retrospective observational study carried out in patients with fractures of the posterior column(PC) of the tibial plateau (Jan2019 and Sept2023). 106 Tibial Plateau fractures were operated. 41 of the PC, of which, 36 had a PM fragment. PM approach was used in 14 patients, 8 of which had involvement of the anterolateral(AL) column adding a changing position to perform the AL approach during surgery. Tourniquet time(TT), time for changing the patient's position and intra- and post-operative complications were recorded. 6 patients with a PM-only approach to PP, the average TT was 1h42mins. 8 patients with the PM and AL approach, spending an average of 23 minutes on changing decubitus, with a total average TT of 3h53mins. At 6 months, all patients had fracture consolidation; acceptable radiological reduction; joint amplitudes of 0° in extension and > 90° in active flexion, with the exception of 4 patients; mean Lysholm score 78. 3 cases with PM fragment treated exclusively AL approach had worse results. The authors, argue that this approach should be considered whenever there is a PM fragment. The need to reposition the patient to approach other column should not impede this principle. The rate of short and medium-term complications is low in this series, with the patients' medium-term functional results being satisfactory.

## The Clinical and Radiological Evaluation of Far Cortex Locking Plate in Distal Femur Fractures

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**Introduction** Locking plates in distal femur fractures were associated with a high rate of non-union and hardware failure. To overcome these drawbacks far cortex locking concept was introduced. It is a novel bridge plating strategy to enhance interfragmentary motion for the promotion of secondary bone healing while retaining sufficient construct strength. The present study evaluated the effects of diaphyseal FCL fixation on fracture healing for periarticular locking plates used for fixation of distal femur fractures. **Materials and methods** Our cohort was of 11 consecutive patients who presented to emergency after distal femur fracture and underwent surgery with the FCL plate between January 2015 and January 2016. Clinical and radiological evaluation was done to look for knee scores and union. Complications like infection, non-union, painful hardware, implant failure were recorded. **Results** No non-union or hardware failure was observed in our cohort of 11 patients. Early callus formation was seen and partial weight-bearing was started at an average of 6 weeks (5-8 weeks). Average time to clinical healing was 10 weeks (8-13 weeks) whereas radiographic union was seen at 16 weeks (14-17 weeks). One patient with an open fracture had superficial surgical wound infection which healed uneventfully after one debridement and with IV antibiotics. The average knee injury and osteoarthritis outcome score (KOOS) at final follow-up was 91 (87-95) in our cohort. **Conclusion** FCL is an effective method to reduce construct stiffness, promote early callus formation, decrease non-union rate and achieve biological healing while retaining sufficient strength to prevent hardware failure.

## Outcomes Following All-Suture Fixation of Patellar Fractures

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**Purpose:** Traditionally, patellar fractures requiring surgery undergo metallic tension band wiring. However, implant-related issues including implant prominence necessitating removal are well reported. All-suture fixation can minimize complications associated with metallic implants but there is a relative paucity of literature on its comparison with metallic fixation. This study reports and compares outcomes between all-suture versus metallic fixation of patellar fractures. **Methods:** 79 patients (49 all-suture and 30 metallic fixation) who underwent fixation for patellar fractures between 2020–2023 were included. Outcomes reported include intra-operative duration, length of stay, bony union time, post-operative knee range of motion and rates of complication and re-operation. **Results:** Mean age was 64.1 years. There was no significant difference in operation duration, length of stay and post-operative knee flexion between the 2 groups ( $p > 0.05$ ). Bony union rate was high in both all-suture (98%) and metal (100%) groups. Bony union time in the all-suture group ( $4 \pm 1.58$  months) was comparable to the metal group ( $4.37 \pm 1.81$  months) ( $p = 0.34$ ). All-suture group had 2 (4.1%) complications compared to 4 (13.3%) complications in metal group. ( $p = 0.194$ ). Of statistical significance, 10% ( $n = 3$ ) of patients with metallic fixation underwent re-surgery due to implant-related complications ( $p = 0.051$ ). In the metallic group, 23.3% ( $n = 7$ ) of patients experienced post-operative flexion contracture compared to 2% ( $n = 1$ ) in the all-suture group ( $p = 0.003$ ). Degree of contracture was greater in the metallic group at  $2.1^\circ \pm 4.6$  as compared to  $0.2^\circ \pm 1.4$  in the all-suture group ( $p = 0.002$ ). **Conclusion:** All-suture fixation of patellar fractures is a safe and reliable alternative to metallic fixation. It has a high union rate, good union time and post-operative range of motion, while avoiding complications from metallic implants.

## Locked Lateral Patellar Dislocation: A Case Report and Review of Literature

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**Introduction:** Acute patellar dislocation is a relatively frequent orthopedic condition. Lateral dislocation often reduces spontaneously or with simple manipulation and closed reduction. Reports of irreducible patellar dislocations are extremely sparse in the literature. We report a very uncommon type of locked dislocation. **Case presentation:** A 24-year-old boy sustained a sudden lateral patellar dislocation while he was playing football. He was unable to stand or bear weight because of the pain, and his knee was in fixed flexion with lateral displacement of the patella. Multiple attempts at closed reduction failed in the emergency department. Computed tomography (CT) images revealed the impaction of the medial articular surface of the patella with the femur. Closed reduction under sedation was required. The patient was placed in a brace for follow-up and referred to a physiotherapist for conservative management. **Conclusion:** Some patellar dislocations may be irreducible on initial attempts, mainly if a fracture is present or a mechanism of impingement impedes relocation. CT imaging plays a crucial role in diagnosis. Manipulation under anesthesia or open reduction in the operating room may be needed.

## Minimal Internal Fixation of Posterior Tibial Plateau Fractures with screws: series case report

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Posterior tibial plateau fracture is less common than other tibial plateau fractures. In addition to bone stability problems, there is also the possibility of posterior cruciate ligament instability. Internal fixation was performed with the hope of fixation fracture fragments and posterior cruciate ligament as well as early mobilization. Cases of motorcycle accident trauma (4 cases), knee pain when moving, knee radiology showing posterior tibial plateau fracture. The operation was carried out with posterior approach of the knee on poplitea fossa, with minimal connective tissue dissection to prevent instability and wider tissue damage. Fixation with minimal implant such as screws and washer. Post operation physiotherapy was carried out with wide range of motion and non weightbearing of the operated leg and posterior drawer test was negative. On average three months after surgery, the range of motion of the knee joint has returned to normal, starting partial weightbearing in the fourth month, full weightbearing starting in the fifth month.



## Does 4 Column Classification of Upper Tibia Fracture Gives You Better Idea of Fixation and Impact on Clinical Outcome-Analysis Of 50 Cases?

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**INTRODUCTION**-The management of proximal tibia fracture has undergone significant changes in the recent years, while the main goal to achieve a smooth articular surface, mechanical axis and joint stability. Recent advances in computed tomography and MRI based imaging have led to better understanding and classification of fracture and therefore better planning for treatment.

This is a prospective analysis of the proximal tibia fracture managed as per 4 column concept in view of functional outcomes.

**MATERIALS AND METHOD**- Radiological and functional outcomes using knee society score of the proximal tibia fractures operated and classified as per computed tomography based 4 column concept were studied at 6 weeks,6 months and 9 months from year 2019 to 2022.

**RESULTS** –Mean age of population sustaining proximal tibia fracture among males was 43.90 years and females was 48.71y with 86% predilection for male and 14% for female. Involvement of right tibia was 50 % in comparison to left tibia which was 46 %, while 4 % patients had involvement of both limbs. Distribution of proximal tibia fracture ; zero column -7.69%,one column- 55.77% ,two column- 21.15% ,three column-15.38% .average knee society score for proximal tibia fracture at the end of 9 months (knee score, function score) 87.65;79.54.

**CONCLUSION**-Recent computed tomography based classification are very useful for fixation and deciding most suited surgical approach for proximal tibia fractures to achieve a smooth articular surface, mechanical axis and joint stability. Still a long-term study with large study group is needed to confirm the usefulness of the same.

## Comparative Analysis of Patellofemoral Chondromalacia between Suprapatellar and Infra-patellar Techniques of Tibial Nailing

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**Introduction:** Tibial shaft fractures, often from high-velocity trauma, prompt the use of Suprapatellar and Infrapatellar approaches for IM nailing. The debate over their optimal application persists, with Suprapatellar nailing gaining traction for its ease, especially in proximal and distal third fractures. While studies have compared clinical outcomes, limited literature addresses knee cartilage status post-surgery. **Methods:** After Institutional Ethics Committee approval, patients aged between 18-45 years who presented to our Level I trauma-centre with AO/OTA type 42 fractures were divided into Suprapatellar and Infrapatellar groups after taking informed consent. Magnetic resonance imaging of the knee and diagnostic knee arthroscopy was done at 6 months follow-up to look for patellofemoral chondromalacia. **Results:** Sixty patients were enrolled in our study. 30 patients underwent nailing by suprapatellar approach and 30 by infrapatellar approach. There was no difference in the grade of chondromalacia observed on MRI knee however on diagnostic knee arthroscopy there was a significantly higher incidence of chondromalacia following suprapatellar nailing. The functional outcome in both groups at 6 months however was statistically similar. **Conclusion:** Suprapatellar nailing is an encouraging method of fixation of tibial shaft fractures and now is being employed for proximal and distal third fractures due to easier technique. However, suprapatellar nailing may be associated with a risk of damage to patella-femoral articular cartilage that may result in knee pain and functional limitations over long-term follow-up effects of the drug have been found in diagnostic arthroscopy at 6 months.

## Free Allogeneous Fibular Strut as a “Biological Intramedullary Nail” for treatment of Tibial Proximal Third Nonunion

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Tibial fractures most commonly occur in its distal two-thirds, with fractures in the proximal third being relatively rare. Nonunion, is the inability to heal a fracture and it involves a fracture persisting for at least 9 months without signs of healing for three months.

We present the case of a 58-year-old woman involved in a motorcycle accident who suffered a fracture of the proximal third of the tibia. Despite undergoing open reduction and internal fixation with compression screws and a buttress plate, she showed no favorable radiographic progression and was confirmed to have nonunion through a CT scan at 10 months after surgery. The treatment of complex nonunion of long bones presents challenges and depends on patient factors, biology, fracture type, surgeon skill, clinical factors and the type of nonunion developed. In this case, an atrophic nonunion was identified, where the treatment goal is to provide mechanical stability and biology to the fracture. Various operative techniques, such as intramedullary nails and compression plates with bone grafts, have been attempted, yielding variable results. Our approach involved antegrade intramedullary nailing of the tibia with a biological structural graft from a cadaveric fibula, following reaming and additional fracture stabilization with a medial plate, which resulted in favorable clinical and radiological outcomes. Identifying effective treatment options for complex nonunions has been a considerable challenge. The implementation of a free autologous intramedullary fibular strut graft provides mechanical stability and promotes osteogenesis, rendering it as a viable option for consideration.

## Masquelet technique combined with microsurgery in reconstruction of massive femoral defect: Double “M” technique

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Patient, male, 22 years old. On September 10, 2019, he was admitted to our department for the first time due to left lower extremity mobility disorder caused by car accident for 5 days. Physical examination: there was a 10cm wound on the left calf with obvious pus exudation; An 8cm wound (sutured) can be seen on the left thigh. Left dorsal foot artery can be palpated, toe movement, slightly poor feeling. After debridement twice and VAC replacement for infection control, on October 18, 2019, the left femur was replaced with internal fixation for the femoral defect with length of 10cm and filled with antibiotic bone cement, which was the first stage of the induced membrane technique. Due to the novel coronavirus outbreak, the patient was readmitted to hospital with "left femur bone defect, soft tissue defect in the middle leg with exposed tibia" on April 24, 2020 (190 days after the first stage of the induced membrane technique). Double-barrel vascularized fibula bone graft with vascular anastomosis was performed. The patient walked with full weight bearing 4 months after surgery. The induced membrane technique combined with microsurgery technology provides a new effective treatment method for the clinical treatment of large bone defect, which can accelerate the healing of bone defect and early rehabilitation exercise.

## Application scope and surgical technique of sural flap for repairing defect after resection of plantar melanoma

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**Introduction:** To investigate the application scope and surgical technique of the sural neurovascular flap (sural flap) for repairing the soft-tissue defect after extensive excision of the plantar melanoma. **Methods:** In 18 patients with the plantar melanoma, the primary tumors were located in the plantar heel area(n=12), lateral weight-bearing area(n=3) and arch area(n=3), with the Breslow thickness ranging from 1.1mm to 5.4 mm. The dimension of the skin islands ranged from 6.0cm×7.0cm to 14.0cm×10cm, and 14 skin islands were larger than 8.0cm×8.0cm. The transferred direction and path of the flap were selected according to the shortest distance from the pivot point to the proximal edge of the defect. **Results:** Seventeen flaps survived; partial necrosis occurred in 1 flap which reconstructed the defect in the plantar heel area, and the residual wound was successfully resurfaced by skin grafting. All patients were followed up for 2 to 53 months. During the follow-up period, the patients were able to walk without obvious pain in affected limbs. Neither local recurrence of the tumor nor ulceration of the flap was observed. **Conclusions:** The sural flap is a good option for reconstruction of the soft-tissue defect after extensive resection of the melanoma in the plantar heel area, arch area and/or lateral weight-bearing area.

## Distally based sural flap in reconstruction of defects over the distal forefoot: a retrospectively analysis

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Distally based sural flaps are widely used for reconstructing soft-tissue defects of the lower extremity. However, reports on the reconstruction of the defects over the distal forefoot using the sural flaps are scarce. Herein, we describe our experience on the reconstruction of these defects using the flaps in a considerable sample size. Between February 2005 and August 2022, a total of 56 flaps in 56 patients were used to reconstruct soft-tissue defects in the forefoot. In order to reduce the length of fascial pedicle and the total length of the flaps, the ankles were fixed in dorsiflexion using a Kirschner wire. Patient and flap factors were compared between the “survival” and “partial necrosis” groups. Overall, 47 flaps survived completely in one stage. Partial necrosis developed in nine flaps, with only one remnant defect covered using a local flap. By fixing the ankles in dorsiflexion, the length of the fascial pedicle was reduced approximately  $2.35 \pm 0.58$  cm, and the total length of the flap was simultaneously shortened. The partial necrosis rate of the flaps with the top edge located in the 8th zone was significantly lower than that in the 9th zone ( $p < 0.05$ ). The distally based sural flaps can be effectively used to reconstruct the defects over the distal forefoot because of convenient harvest and reliability. By fixing the ankle in dorsiflexion with Kirschner wire, the top edge of the flaps will be decreased, and this procedure is helpful for the flaps survival.

## Traumatic Amputations on Extremities and Reconstructive Possibilities for Preservation of Anatomical Integrity

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**Introduction:** Traumatic amputations on extremities are extremely severe injuries. There are many complex procedures for preservation of anatomical integrity, but with significant limitations. Also, several decades of experience, scientific and technical development provide significant possibilities. Extreme complexity of these problems still makes doubts and challenges very common.

**Aim:** This work presents experiences of one surgical team and one institution in solving most difficult traumatic amputations on extremities in aim to preserve anatomical integrity and function.

**Method:** The included patients had complete amputations on extremities. We are presenting injured extremity, the course of healing and achieved recovery in clinical seria. In initial treatment, it is necessary to provide survival of amputated part of the extremity and also the reconstruction of anatomical structures. Tissue with poor circulation must be covered with flaps or grafts. In further surgical treatment, reconstructive healing is focused on achieving functional length and configuration of extremity.

**Results:** The result depends on width of injury zone and tissue destruction, time passed, other existing injuries, patient's general condition, experience of surgical team and availability of necessary materials during healing. It is possible to achieve results which exceed the expectations and give full satisfaction for efforts made by surgical team.

**Conclusion:** The preservation of anatomical integrity in traumatic amputations remains a challenge in reconstructive surgery. Individual approach and plan are necessary – how much is possible to achieve in initial surgical treatment and how much in later healing phases.

**Keywords:** traumatic amputations, reconstructive healing, preservation of anatomical integrity

## Regenerative peripheral nerve interface prevents neuroma formation after peripheral nerve transection

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Neuroma formation after peripheral nerve transection often leads to severe neuropathic pain. Regenerative peripheral nerve interface has been shown to reduce painful neuroma in the clinic. However, no reports have investigated the underlying mechanisms, and no comparative animal studies on regenerative peripheral nerve interface and other means of neuroma prevention have been conducted to date. In this study, we established a rat model of left sciatic nerve transection, and subsequently interfered with the model using the regenerative peripheral nerve interface or proximal nerve stump implantation inside a fully innervated muscle. Results showed that, compared with rats subjected to nerve stump implantation inside the muscle, rats subjected to regenerative peripheral nerve interface intervention showed greater inhibition of the proliferation of collagenous fibers and irregular regenerated axons, lower expressions of the fibrosis marker  $\alpha$ -smooth muscle actin and the inflammatory marker sigma-1 receptor in the proximal nerve stump, lower autophagy behaviors, lower expressions of c-fos and substance P, higher expression of glial cell line-derived neurotrophic factor in the ipsilateral dorsal root ganglia. These findings suggested that regenerative peripheral nerve interface inhibits peripheral nerve injury-induced neuroma formation and neuropathic pain possibly via the upregulation of the expression of glial cell line-derived neurotrophic factor in the dorsal root ganglia and reducing neuroinflammation in the nerve stump.



## Effects of regenerative peripheral nerve interface on dorsal root ganglia neurons following peripheral axotomy

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Long-term delayed reconstruction of injured peripheral nerves always results in poor recovery due to retrograde cell death among injured sensory neurons of dorsal root ganglia (DRG). A regenerative peripheral nerve interface (RPNI) could generate new synaptogenesis between the proximal nerve stump and free muscle graft. However, the effect of RPNI on injured sensory neurons is still unclear. Here, we aim to investigate the potential neuroprotective role of RPNI on sensory DRG neurons after sciatic axotomy in adult rats. The rats were randomly divided into three groups following this nerve injury: no treatment (control group), nerve stump implantation inside a fully innervated muscle (NSM group), or nerve stump implantation inside a free muscle graft (RPNI group). There were significantly higher densities of neurons in ipsilateral DRGs of RPNI group than NSM and control groups at 8 weeks post-axotomy. Meanwhile, neuronal apoptosis index and the expressions of pro-apoptotic Bax within the ipsilateral DRGs were significantly lower in the RPNI group than those in the control and NSM groups, while the opposite result was observed in the expression of pro-survival Bcl-2. Furthermore, the expressions of NGF, NT-3, BDNF, and GDNF were also upregulated in the ipsilateral DRGs in the RPNI group. Taken together, RPNI could prevent neuronal loss after peripheral axotomy. And the neuroprotection effect has a relationship with the upregulation of NTs in DRGs, such as NGF, NT-3, BDNF and GDNF.

## Synovial sarcoma in the ankle mimicking a malignant peripheral nerve sheath tumour: case report of a rare tumor in a rare location challenging diagnosis and multidisciplinary treatment

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**Introduction:** Synovial sarcoma, account for 7–8 % of malignant sarcomas. It originates from multipotent stem cells rather than the synovium. This report highlights a rare case of a localized synovial sarcoma in the ankle region, that mimicked throughout as a malignant peripheral nerve sheath tumour (MPNST). **Methods:** Patient presented with a history of pain and swelling over the medial aspect of the left ankle for eight years. A doctor in 2021 had treated the patient as incision and drainage assuming it to be infection, but the symptoms persisted. The pain and swelling later aggravated. Examination revealed an extremely tender subcutaneous swelling just below the medial malleolus that measured 4 X 2 cm, and was fixed to the underlying structures. MRI revealed an ill-defined irregular marginated lobulated space occupying lesion posteroinferior to medial malleolus engulfing the underlying neurovascular bundle. FNAC showed MPNST. A wide excision of the lesion was done. **Results:** Biopsy was reported as initially to be MPNST. However later after immunohistochemistry studies, it came to be reported as synovial sarcoma. Then it was planned for chemoradiation and achieve limb salvage. **Conclusion:** Synovial sarcoma of the ankle is very rare with only 5 reported cases in literature characterized by insidious progression and a high metastatic risk. MRI is indispensable for diagnostic orientation, later confirmed through histological examination. MPNST and synovial sarcomas share overlapping of histomorphological features. Surgery remains the mainstay therapy, with radiotherapy and chemotherapy contributing to enhanced local control.

## The role of DSA in preoperative design of free flap

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**Introduction:** To investigate the role of Digital subtraction angiography (DSA) in the assessment of preoperative vascularization of free flaps in order to make the best choice for surgical procedures.

**Methods:** From January 2019 to June 2022, we assessed the vascular conditions of the affected area and the donor area DSA before free flap surgery. Vascular conditions were used to determine the surgical program. A total 20 cases, 17 cases had ideal vascular conditions, 3 cases had poor vascular conditions. We use different surgical operative methods. **Results:** All cases were followed up for 2-12 months, an average of 8 months, and flaps survived in 19 cases. One of them had necrosis on the edge of the flap and the wound was infected. After a thorough debridement, dressing change and skin graft healing, the wound healed. **Conclusion:** Patients with preoperative flaps with well-developed main arteries have good skin flaps after surgery. Patients with poorly-developed main arteries in the pre-operative skin flaps should be treated individually according to specific conditions. The risk is greater, preoperative DSA evaluation of the vascular conditions in the affected area can better formulate the surgical plan and reduce the risk of flap necrosis, which can be clinically used.

## Ring finger reconstruction by Colson's flap in children

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The abdominal flap graft by Colson is an original technique used for covering deep skin defects of the hand and fingers. Material & Methods : we present 10 cases of complete avulsion of the skin sheath and nail apparatus of the finger due to a ring in children. Results: The average age of the patients was 8 years with male predominance. The time of admission to the emergency room ranged from [2-6h] post-trauma. Digital collateral arteries were torn in front of the first phalanx in 6 cases. Collateral nerves were contused in 8 cases. The denuded finger had a bone lesion in 3 cases, with no tendon injuries. Joint mobility was preserved in 7 patients. Bone regularization at the distal part of P3 was performed in 2 cases. Emergency coverage of the denuded finger was done using a Colson flap graft in 9 cases and secondarily in one case that initially had skin suturing with subsequent necrosis, followed by a second weaning after 3 weeks. Superficial necrosis was noted in 2 cases that had skin grafts, and 3 cases of edge necrosis evolved well into directed healing. Conclusion: This simple and reliable reconstruction technique allows for the achievement of a functional and sensitive finger with satisfactory aesthetic results.

## Revisit of flap factors relating to partial necrosis of distally based sural flaps: an analysis of 435 cases in a single center

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Partial necrosis is an ongoing topic in regard to flap complications of the distally based sural (DBS) flap. The present study is to further illuminate the flap-related risk factors and the effects of several technical improvements. We retrospectively reviewed 429 patients who underwent 435 DBS flaps between April 2001 and December 2019. The reconstruction outcomes, flap viability-related complications, and potential risk factors were compared between the survival group and partial necrosis group, as well as between group A (from April 2001 to March 2010) and group B (from April 2010 to December 2019). Among the 435 flaps, 39 flaps (8.97%) exhibited partial necrosis. With the increase of the top edge, the partial necrosis rate increased significantly ( $P < 0.05$ ). When the length-to-width ratio [LWR] of the flap was more than 5:1 or the total length of the flap was more than 20 cm, the partial necrosis rate increased significantly ( $P < 0.05$ ). The partial necrosis rate in group B (5.86%) was significantly lower than that in group A (13.41%) ( $P = 0.007$ ). The top edge of the flap is an essential indicator for predicting the prognosis of the DBS flap. When the total length of the flap is more than 20 cm or the LWR of the flap more than 5:1, the partial necrosis rate will increase significantly. Various technical modifications can lower the top edge of the flap and reduce the LWR of the flap and width of the skin island, and thus improve the flap survival effectively.

## The distally based sural flap

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The distally based sural fasciocutaneous flap was firstly introduced by Donski and Fogdestam with a description of the surgical procedure in 1983. Based on the anatomy of the sural area, Masquelet et al described the close relationship between the vascular axis of the sural nerve and the vascularity of the sural flap in detail in 1992. Since then, the distally based sural fasciocutaneous flaps had become a mainstay for reconstruction of soft tissue defects over the distal lower leg, ankle, and foot. A great number of publications relating to the distally based sural fasciocutaneous flaps had been published over the past 40 years in various types. The PubMed, EMBASE, and Cochrane databases were searched with the title terms of “sural” and “flap” or “flaps” through December 2022. Excluding non-English language papers, medial and lateral sural flaps, peroneal artery perforator free flaps and repetitive literatures, 350 publications were obtained. A total of 148 articles with more than 10 cases of each in the literature, 4580 cases were analyzed; 382 displayed partial necrosis, 87 developed complete necrosis, 131 developed marginal necrosis, and the necrosis rate (partial plus complete) was 10.24%. There were several debates about the following questions: Venous treatment, ligation? A match? Bloodletting? Nerve anastomose? With or without deep fascia? Carry muscle sleeves? Pedicle, perforator only, fascia pedicle, fascia skin pedicle? Transposition mode? Donor area treatment, et al. There are also many problems for us to solve for utilizing the distally based sural flap optimally.

## Modified lateral gastrocnemius myocutaneous flap with extended anterior and/or inferior boundary

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There is little information regarding the boundaries of the lateral gastrocnemius myocutaneous (LGM) flap. The aim of this study was to introduce the modified technique of the LGM flap with extended anterior and/or inferior boundaries and its anatomical basis. Five fresh lower limb specimens were perfused and radiographed. Between December 2003 and August 2018, 27 modified LGM flaps with extended anterior and/or inferior boundaries were raised in 27 patients to reconstruct the soft tissue defects over the middle and upper leg, knee, and lower thigh. Both the lateral popliteal cutaneous artery and musculocutaneous perforators from the lateral sural artery had rich linked arteries communicating with the chain-linked arterial network around both the posterolateral intermuscular septum and the sural nerve, and they also had rich transverse communicating arteries connecting with the perifascial arterial network overlying the anterior compartment in the upper and middle calf. Continuous fascial arterial networks were extended up to the level at the intermalleolar line. Twenty-three flaps survived uneventfully, 2 flaps displayed distal de-epithelialization, and 2 flaps (7.41%) developed partial necrosis. Osteomyelitis was cured successfully in all patients, and no relapse of infection was encountered during the follow-up period. Multiple feeder arteries are the arterial anatomic basis of the modified LGM flap. The modified LGM flap with extended anterior and/or inferior boundaries is feasible, and the modified flap with extended anterior boundaries is safe and reliable.

## Ultrasound-guided interventions in orthopaedic surgery.

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**Introduction:** Using Hyaluronic Acid or Platelet-Rich Plasma in the conservative therapy of various musculoskeletal (MSK) pathologies can be more effective using ultrasound (UZ) guidance. In many countries, these methods are part of interventional radiology but can also be very useful in the hands of orthopaedic surgeons. We refer to our experiences providing an educational system to develop skills in UZ-guided procedures and a list of basic pathologies in which conservative treatment could be more effective. **Methods:** We set up educational and cadavers-based simulation courses for MSK UZ-guided interventions for orthopaedic surgeons. We evaluated their effectiveness and completed a list of pathologies that can be easily reached using UZ guidance. **Results:** Attending a special educational course in MSK UZ led to the gaining of independence of orthopaedic surgeons to interventional radiologists. This method brought them new conservative treatment options in the worst accessible joints like the hip or small joints of the hand and foot. Targeted therapy of soft tissues can improve the effectiveness of therapy for rotator cuff, Achilles tendon, or common extensor tendinopathies. Also, special methods like needling soft tissue pathologies or barbotage of rotator cuff calcifications can bring a satisfactory result. **Discussion:** US-guided interventions are safe and effective conservative therapy options that orthopaedic surgeons could provide. Attending specialised courses could shorten the learning curve for these methods.



## Biomagnetism is a compass in development

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The fertilized ovum divides into two blastomeres, each carrying a genetic program for the development of the entire organism. If separated, the normal development of twins continues because differentiation hasn't yet begun. During the division, halves of the centrosome separate and repel to opposite sides, creating a spindle connected to chromosomes. Electrons move through it, aligning chromosomes in the equatorial plane, and after separation, they settle at an appropriate distance. The first cleavage passes through both poles, the second is perpendicular to the plane of the first, forming a morula, then a blastula with embryonic layers, and finally, a gastrula where the organizer forms at the dorsal lip (Spemann and Dangoth experimentally demonstrated that this substance, with a transplanted part of the dorsal lip, induces the differentiation of the host blastocyst). However, today we must accept that the organizer is actually a catalyst intensifying processes in blastocysts. Biomagnetism from the organizational center opens genetic messages, aligning with the existing chemical-structural state, leading to new chemical-structural states and radial biomagnetic vectors from blastocysts. These intersect with vectors from the organizational center, successively repeating and precisely developing appropriate chemical processes, intercellular boundaries, organ boundaries, and body shape. Recently, stimulation is applied to the fingertip with a catalyst (organizer), growing a finger with the same imprint as the amputated one. Kyphosis exhibits more intense development of the hemi-cranium before correction, and after, it continues to develop normally due to the normal axial action from the organizational center.

## Road traffic accidents in Libya what should be done?

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Road traffic accidents in Libya is a major issue for the country with high rate of fatality as well as economic burden,

with a specific target to reduce fatalities by 3-5% every three years. However, it seems that the country has faced challenges in meeting this target, as indicated by slipping out of the road infrastructure quality ranking by the World Economic Forum. In this paper we raise the red flag and point few as recombination Improving road safety requires a multi-faceted approach, including better infrastructure, stricter enforcement of traffic laws, public awareness campaigns, and investment in emergency response services. It's essential for policymakers to address these issues comprehensively to make meaningful progress in reducing road traffic accidents and fatalities.

## Challenges for quality control of institutional bone banking in developing countries

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**Objective:** To evaluate the sustainability and effectiveness of our institutional bone banking over the past thirteen years and to ensure that we can provide high standard allografts with a low infection rate.

**Design:** Retrospective observational cohort.

**Setting:** Surgical bone bank and orthopedic inpatients in a tertiary care hospital.

**Participants:** The study included 895 adult orthopedic patients.

**Methods:** Retrospective analysis of two audits of institutional bone banking was conducted on 562 donors and 333 recipients from January 2007 to December 2019. The incidence and predisposing factors for the overall rejection rate of retrieved femoral head allografts, as well as the effectiveness of bone allograft handling measures, and the outcome of bone transplantation, were analyzed.

**Results:** The overall discard rate of bone allografts after thirteen years of bone banking was 26.86%. There was a significant decrease in allograft contamination from 12.54% during the first audit compared to 4.49% in the second survey ( $P < .05$ ). The inability to perform serology retests after 6 months (15.72%) in the second survey significantly increased compared to 7.11% in the first audit ( $P < .05$ ). The organism most commonly identified was the Staphylococcus species in both audits. The overall allograft-related infection rate after thirteen years of bone banking was 1.80%.

**Conclusions:** Throughout thirteen years of bone banking, our results show that the overall rejection rate and allograft-related infection rate are under international standards. Besides stringent aseptic allograft handling, donor motivation, and institutional support are extremely important for its efficient functioning.

## 222 nm ultraviolet light germicidal effect on the bacteria in surgical field of rabbits

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**Introduction:** Ultraviolet C (UVC) has not only bactericidal effect but also cytotoxicity. However, UVC with a wavelength of 222 nm having a high absorption coefficient for proteins is considered highly safe. We reported on the safety of 222 nm UVC irradiation in humans and rabbits. The aim of this study is to evaluate the bactericidal effect of 222 nm UVC irradiation on exposed surgical sites.

**Methods:** The study involved 16-week-old female rabbits. The exposed area on the back was sprayed with a washing solution from the swab that had been scraped on both soles. Three groups were formed: one exposed to 500mJ/cm<sup>2</sup> of 222nm UVC irradiation, another exposed to 200mJ/cm<sup>2</sup> of 254nm UVC irradiation used in germicidal lamps, and a non-irradiation group. After irradiation, the washing solution of the swab that scraped the fields was cultured at 37°C for 48 hours, and the colonies were enumerated. A bacterial flora analysis of the solution wiped from the soles was conducted. **Results:** The colony number was significantly reduced in both UVC irradiation groups, compared to the non-irradiated group, without any significant differences between the UVC groups. Analysis of the bacterial flora of the solution inoculated into the surgical field revealed the presence of bacterial species which can cause SSI in humans. **Discussion:** This study suggested that 500mJ/cm<sup>2</sup> of 222nm UVC irradiation has a bactericidal effect and is as effective as 200mJ/cm<sup>2</sup> of 254nm. Therefore, 222nm UVC irradiation could be a new tool for sterilization of the surgical field.

## Efficacy of Continuous Local Antibiotic Perfusion in the Management of Fracture-Related Infections

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**Introduction:** Fracture-related infections (FRI) pose a significant challenge in fracture management. The novel method of Continuous Local Antibiotic Perfusion (CLAP) has emerged as an effective strategy for managing these infections. CLAP is a system that delivers antimicrobials locally without increasing blood levels by creating a collection channel and has the advantage of destroying implant biofilm formation with direct high concentration antimicrobials. This study evaluates the efficacy of CLAP in managing FRI. **Subjects:** This study includes ten patients (eight males and two females, mean age 45.6 years) who received CLAP for FRI at our institution from May 2020 to December 2023. **Results:** CLAP was performed in five cases in the lower leg, four in the foot, and one in the forearm. The average duration of CLAP treatment was 13.7 days. Nine patients successfully retained their implants post-treatment. However, one patient experienced a recurrence of infection post-CLAP, necessitating implant removal and re-treatment. Notably, all patients eventually achieved infection resolution and bone fusion. No instances of renal dysfunction or hearing loss, potential side effects of gentamicin used in CLAP, were observed. **Conclusion:** The results suggest that CLAP is a promising approach for treating FRI, potentially allowing for implant retention while effectively managing infection.

## The Impact of Microbiological Tests on the Treatment Outcome of Spondylodiscitis

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**Introduction:** Infectious spondylodiscitis (IS) presents a life-threatening infection. Its incidence is on the rise annually, attributed to the aging demographic and increased spinal surgical interventions. Despite advancements, the mortality rate of IS remains relatively stable. Notably, a negative microbiological culture might serve as an unfavorable prognostic indicator, necessitating further validation. Hence, this study aims to evaluate the influence of a negative microbiological result on the treatment outcome of spondylodiscitis. **Materials and Methods:** The study, conducted from 2017 to 2022, included 39 IS cases of treatment of patients with a minimum 2-year follow-up. IS diagnosis relied on MRI data, bacteriological tissue examination, clinical manifestations, ESR, and blood CRP. Patients were categorized into two groups: culture-positive and culture-negative infection (CPI and CNI). Adverse outcomes encompassed patient mortality and relapse. **Results:** CNI incidences were observed in 41% (n=16) of patients. Polymicrobial CPI was found in 2.6% (n=1) of patients, represented by *Pseudomonas aeruginosa* with *Enterococcus faecalis*, *Enterococcus faecium*, and *Staphylococcus epidermidis* MRSE. Monomicrobial CPI was observed in 56.4% (n=22) of patients, caused by *Staphylococcus aureus* (50.0%) or Enterococci (13.6%), coagulase-negative Staphylococci (9.1%) and Streptococci (9.1%). Gram-negative microorganisms represented by *Escherichia coli* and *Pseudomonas aeruginosa* at 9.1% each. Adverse outcomes, including mortality in 6.3% CNI and 4.3% CPI (1 case in each group), and recurrence in the CPI group at 8.7%, were recorded. Complications in CPI patients were attributed to *Pseudomonas aeruginosa*, resulting in mortality (two monocultures and one microbial association). **Conclusion:** CNI exhibited improved treatment outcomes.

## Outcomes of Two Stage Exchange Arthroplasty of Hip and Knee for Prosthetic Joint Infection. A pre-formed Antibiotic-Loaded Acrylic Cement Spacer for Hip and Knee.

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**Introduction:** Pre-formed antibiotic-loaded acrylic cement spacers (pALACS) for hip and knee contribute to comfortable treatment of chronic periprosthetic joint infection (PJI) of the hip and knee in two-stage replacement arthroplasty.

**Methods:** In the study 48 patients had undergone two-stage replacement surgical procedure due to the chronic PJI. P-ALACS spacers for hip or knee were introduced during the first stage of surgical procedure. Patients' treatment process had been monitored for 120 months (range 4-120 months). The timing of reimplantation was based on laboratory values (C-reactive protein values <10) and clinical improvements..

**Results:** In the first act of revision surgery were implanted 33 (68,75%) pALACS for the hip and 15 (31,25%) pALACS for the knee. Two patients (4,16%) with the hip pALACS has been still awaiting the second surgery pending the periprosthetic infection sufficient reduction. In five patients (10,4%) with knee pALACS after the first act of revision surgery pALACS was removed and they had to undergo knee arthrodesis. 41 patients (85,4%) had successfully undergone two-stage replacement arthroplasty with the implementation of the knee or hip pALACS, respectively, in the first stage surgery.

**Conclusions:** Implementation of the pre-formed ALACS appeared effective in treatment of infection and simplified the second act of surgery - reimplantation.

**Keywords:**

Chronic periprosthetic joint infection of the hip and knee, pre-formed ALACS, two-stage exchange arthroplasty.

## Verification of diagnostic criteria for periprosthetic infection in patients with rheumatoid arthritis

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**Introduction:** Patients with rheumatoid arthritis (RA) are 1.8 to 4 times more likely to be at risk of infection after joint arthroplasty. High levels of inflammatory markers caused by RA mimic periprosthetic infection (PPI). The lack of communication of infection with the endoprosthetic cavity and negative microbiological culture results complicate the verification of PPI. **Purpose of the Study:** To compare the criteria for diagnosing PPI with RA using X-ray data and the results of bacteriological cultures. **Materials and Methods:** The study was included patients with RA with instability of the knee joint prosthesis according to radiographs. X-ray data were compared with the diagnostic criteria for PPI according to the International Consensus Meeting on Prosthetic Joint Infection (ICM, 2018). Microbiological cultures were obtained from synovial fluid punctates, intraoperative tissues, and swabs from removed implants after ultrasonic treatment. **Results:** Among 524 patients treated for PPI at 2014-2022, patients with RA accounted for 6.5% (n=34). Pathogens were observed in 70.6% (n=24). Punctures of synovial fluid proved to be the most informative criterion (growth observed in 70.6%), followed by tissues (55.9%) and washings (47.1%). Major criteria confirming the PPI were a communicating cavity with the joint (38.2%), double positive cultural studies (14.7%), and results according to minor criteria of 6 points or more (32.4% of cases). Negative bacterial cultures alongside other positive criteria for PPI were found in 14.7% (n=5) of cases. **Conclusion:** The ICM diagnostic criteria (2018) are applicable for diagnosing PPI in patients with RA, even in cases with negative microbiological results.



## The Importance of Inflammatory Markers in Synovial Fluid for Periprosthetic Infection Diagnosis

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**Introduction:** Microbiological diagnostics form the foundation for diagnosing periprosthetic infection (PPI). However, the frequency of culture-negative infection ranges from 7% to 42%. In such instances, synovial markers can enhance infection diagnosis due to their higher sensitivity and specificity compared to serum markers. **The purpose of Study:** To identify the most specific and sensitive synovial marker for diagnosing PPI. **Materials and Methods:** An analysis of CRP (C-reactive protein), IL-6 (Interleukin-6), and presepsin in synovial fluid was conducted in 66 patients with knee (n=41), hip (n=23), and shoulder (n=2) joints. Among them, there were cases of septic instability with positive culture growth (n=17) and aseptic cases (n=49). **Results:** Threshold values were determined for CRP - 5.6 mg/l, presepsin - 1212.0 pg/ml, and IL-6 - 988.5 pg/ml, with sensitivity, specificity, and negative predictive values of 62.5%, 85.7%, and 87.5%; 87.5%, 63.0%, and 93.6%; 43.8%, 79.6%, and 94.1% respectively. **Conclusion:** Among the investigated synovial markers, synovial CRP exhibited the highest diagnostic significance, demonstrating a specificity of 85.7% with a minimal negative predictive value.

## Fixateur externe for geriatric multifragmentary distal radius fractures- a valuable alternative!

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Geriatric fractures tend to make up most of our fracture cases, they should not require additional surgery like implant removal.

The ex-fix for the radius is mostly seen as a temporary tool in the unfit/polytraumatized patient and Osteoporosis is even mentioned as a contraindication.

We strongly disagree.

To prove our point and advocate our strategy, we present the case of a fit 82-year-old lady who is still living by herself and managing her own household. After losing balance our patient tripped over an ironing board and suffered a severely comminuted fracture of the distal forearm both radius and ulna.

As primary measure, the team on call decided to apply an ex-fix, do a CT scan and have the trauma team perform ORIF.

The CT after ex-fix application showed severe comminution but an excellent reduction in the presence of the known severe osteoporosis of the patient.

Any attempt to perform ORIF would have required bone graft and plates from both dorsal and volar aspect of the radius as well as on the distal ulna.

After 6 weeks, the ex-fix was removed in the local rural clinic by our team, as this does not require analgesia or sedation but good communication with the patient only.

The patient used a brace for an additional 4 weeks and then removed it gradually over another 2 weeks.

We saw the patient last 6 months after surgery; the radius fracture is consolidated in 0° volar tilt with excellent joint mobility and a very satisfied patient.

## Five cases of posterior fixation for osteoporotic vertebral fractures with cement-augmented pedicle screws.

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**Introduction:** Spinal fixation surgery for osteoporotic vertebral fractures sometimes lead to complications including screw loosening and new vertebral fractures. Since cement-augmented pedicle screws were introduced in Japan in 2020, their postoperative outcomes have been under investigation due to their potential to reduce such complications. This report examines the efficacy of cement-augmented pedicle screws in five patients, focusing on two illustrative cases. **Case Summaries:** Case 1 detailed a 78-years-old female with a T11 fracture. She underwent T10-L1 posterior fixation, T11 vertebroplasty, and T11/12 laminectomy. There were no new postoperative vertebral fractures, and pain control was excellent. Case 2 detailed an 85-year-old female with an L3 fracture. She underwent L2/3 TLIF and L1-3 posterior fixation. Two months postoperatively, a new vertebral fracture at L1 was observed. She experienced significant back pain during activities, and 8 months postoperatively, underwent T12/L1 laminectomy and additional T10-L1 posterior fixation. **Result:** In our five cases, three of five patients had new postoperative vertebral fractures, two of which patients required reoperations. On the other hand, screw loosening was only 10%. **Discussion:** These studies indicate the risk of new vertebral fractures despite the use of cement-augmented pedicle screws. However, in a previous study, the pullout strength of cement-augmented pedicle screws was reported to be 2.4 times higher than that of normal screws, and in this study, screws were less loose. These findings suggest that while cement-augmented pedicle screws offer an improved fixation method for osteoporotic vertebral fractures, the prevention of proximal junctional kyphosis remains a complex challenge.

## Vertebral Cement Augmentation: Decisional Regret at One-Year follow-up

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**Introduction:** Kyphoplasty and vertebroplasty are commonly performed procedures for compression fractures in osteoporotic patients, known for their safety and efficacy. However, while numerous studies have assessed clinical and radiological outcomes post-procedure, there remains a dearth of research examining decisional regret among patients. Understanding the presence and extent of regret following vertebral cement augmentation can provide valuable insights for patient counselling and management. **Methods:** A retrospective analysis was conducted on 187 consecutive patients who underwent kyphoplasty or vertebroplasty between January 1, 2021, and July 31, 2022, with a minimum one-year follow-up. Pre- and post-surgery radiographs were evaluated, and decisional regret was assessed using the Ottawa Regret Questionnaire (ORQ) at the one-year mark. Patients scoring 0-40 on the ORQ were classified as experiencing low regret, 40-60 as medium regret, and above 60 as high regret. Incidence of cement leak and radiological parameters such as height restoration and local kyphosis were compared between groups. **Results:** Kyphoplasty was performed in 54% of cases, while vertebroplasty in 46%. Low and medium regret were reported in 20% and 80% of kyphoplasty patients, respectively, and in 23% and 77% of vertebroplasty patients. Chi-squared analysis revealed similar rates of cement leak between groups. Patient complaints were pain at sites unrelated to the compression fracture. No significant differences observed between low and medium regret groups. **Conclusion:** Vertebral cement augmentation procedures exhibit low to medium levels of regret at the one-year mark, irrespective of radiological outcomes. These findings underscore the importance of comprehensive pre-procedural counselling to manage patient expectations effectively.

## Comparison Of Open Versus Closed Reduction and Fixation with Locking Plates Of Supracondylar Periprosthetic Femoral Fractures With Stable Prostheses

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**INTRODUCTION** The anatomic distal femoral locking plate (DF-LCP) has simplified the management of supracondylar femoral fractures with stable knee prostheses. Osteoporosis and comminution seem manageable, but at times, the construct does not permit early mobilization. Considerable soft tissue stripping during open reduction and internal fixation (ORIF) may delay union. Biological plating offsets this disadvantage, minimizing morbidity. Materials Thirty comminuted periprosthetic supracondylar fractures were operated from October 2010 to August 2016. Fifteen (group A) were treated with ORIF, and fifteen (group B) with closed (biological) plating using the anatomical DF-LCP. Post-operatively, standard rehabilitation protocol was followed in all, with hinged-knee-brace supported physiotherapy. Clinico-radiological follow-up was done at 3 months, 6 months, and then yearly (average duration, 30 months), and time to union, complications, failure rates and function were evaluated. Results Average time to union was 4.5 months (range, 3–6 months) in group A, and 3.5 months (range, 2.5–5 months) in group B. Primary bone grafting was done in twelve patients (all group A). At final follow-up, all fractures had healed, and all (but two) patients were walking unsupported, with no pain or deformity, with average knee range of motion (ROM) of 90° (range, 55 to 100°). Two patients had superficial infection (group A), two had knee stiffness (group A), one had shortening of 1.5cm (group B) and one had valgus malalignment of 10 degrees (group B). **Conclusion** Biological plating in comminuted supracondylar fractures about stable TKA prostheses is an excellent option, may obviate need for bone grafting, and reducing complications.

## Efficacy of Novel Regional Anaesthetic Techniques in Day-case Arthroplasty

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Traditional regional anaesthetic techniques for hip and knee arthroplasty such as femoral and sciatic nerve blocks provide excellent analgesia but at the expense of muscle weakness. Thus, they preclude early mobilisation. Infiltration of local anaesthetic between the popliteal artery and capsule of the knee (iPACK) and pericapsular nerve group block (PENG) are novel regional anaesthetic techniques that have not been well studied. iPACK targets the sensory articular branches of the sciatic nerve whilst sparing motor branches of the tibial and common peroneal nerves. PENG targets the anterior hip capsule through blocking articular branches of the femoral, obturator and accessory obturator nerves whilst sparing motor function. This study aims to evaluate the effectiveness of iPACK and PENG in a case series of 47 consecutive day-case arthroplasty patients. Operations performed were total knee replacement (TKR) (20/47), uni-compartmental knee replacement (UKR) (8/47) and total hip replacement (THR) (19/47). For TKR and UKR patients, the mean post-operative Visual Analogue Scores (VAS) for pain were 4/10 (immediate), 5/10 (6 hours) and 5/10 (24 hours). The mean time to mobilisation was 191 minutes and mean post-operative opioid consumption was 65mg (0 – 240mg). For THR patients, the mean VAS for pain were 4/10 (immediate), 5/10 (6 hours) and 5/10 (24 hours). The mean time to mobilisation was 206 minutes and mean post-operative opioid consumption was 25mg (0 – 55mg). There were no nerve block related complications. We conclude that employing a precise and targeted regional anaesthetic strategy facilitates the provision of arthroplasty as a day-case procedure.

## Foraminal and extraforaminal lumbar disc herniations -outcomes of fluoroscopically guided transforaminal epidural steroid injections.

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**Introduction:** Lumbar disc herniation is a common cause of lower extremity weakness and pain, but is less commonly located in the foraminal region (<10% of cases). Transforaminal epidural steroid injection (TFESI) is widely used to manage lumbar radiculopathy originated in the foraminal region.

**Methods:** This was a retrospective review. Between 2021- 2022, 79 patients with severe lumbar radiculopathy secondary to foraminal and extraforaminal disc herniation which had not resolved with rest and non-steroidal anti-inflammatory drugs were treated with fluoroscopically guided foraminal injection of local anaesthetic and steroids. They were assessed using standardized forms as well as the Low Back Outcome Score (LBOS) and VAS for pain and were reviewed at an average of 1.8 years (1 to 3 ) after injection by an independent observer. **Results:** Relief of symptoms was obtained in 72 patients (91.1%) after TFESI. Seven patients (8,9%) subsequently relapsed, requiring surgery. Thus 72 patients available for long-term follow-up had considerable and sustained relief from their symptoms. The average score before foraminal infiltration was 24 out of a possible 75 points. At follow-up, the overall average score was 56, and in those who had obtained relief of symptoms it had improved to a mean of 63. Overall, there was a significant improvement in the VAS (pre-inj:  $8.21 \pm 2.1$ ; post-inj:  $1.59 \pm 1.2$ ;  $p < 0.0001$ ). **Conclusion:** Based on these findings we recommend fluoroscopically guided foraminal injection of local anaesthetic and steroids as the primary treatment for patients with severe radiculopathy secondary to foraminal or extraforaminal herniation of a lumbar disc.

## Partial Nail Avulsion as a Minimally Invasive Technique in the treatment of an Elusive and Rare Soft Tissue Neoplasm

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In the realm of soft tissue neoplasms, digital fibromyxoma (DF) stands as a rare and benign entity, frequently targeting the digits, especially the nail apparatus. Its clinical manifestation involves a gradual development of a mass, accompanied by xanthonychia, nail thickening, and proximal paronychia. This often leads to diagnostic challenges, with frequent misidentification as a fungal infection. The primary approach to address DF is through en-bloc resection, despite a notable recurrence risk and subsequent nail deformity. This case study describes a 48-year-old female presenting with a two-year history of discoloration and thickening of the right third fingernail. Initial primary care treatment with anti-fungal agents was ineffective. Radiological exams and clinical history suggested signs of soft tissue neoplasm. Surgical excision was decided upon, and partial proximal plate nail avulsion was performed. This procedure unveiled a consistent, gelatinous, and well-demarcated flesh-colored lesion. Histopathological examination validated the diagnosis of DF, showcasing CD34 positivity and pS-100 immunomarker negativity. Over the subsequent 12 months of follow-up, the patient remained completely asymptomatic, free from any signs of lesion recurrence or nail dystrophy. Emphasizing the importance of preserving the nail matrix and achieving optimal clinical outcomes, this case report advocates for the adoption of minimally damaging techniques in these rare soft tissue lesions. Recognizing this rare entity and understanding its characteristic presentation holds utmost significance for ensuring precise diagnosis and timely surgical management.



## Reoperation after surgery for bone metastasis of renal cell carcinoma

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**Background and Objective:** The prognosis of metastatic renal cell carcinoma has markedly improved with the advent of molecular targeted therapies and immune checkpoint inhibitors. However, the therapeutic response in patients with bone metastasis remains low; therefore, surgery still plays a significant role in treatment of bone metastasis. It is important to maintain quality of life for patients with bone metastasis from renal cell carcinoma and avoid reoperation after surgery for bone metastasis. Therefore, we investigated the risk factors for reoperation after surgery in patients with bone metastasis from renal cell carcinoma.

**Methods:** We retrospectively studied 103 bones of 97 patients who underwent surgery for bone metastasis of renal cell carcinoma from 2001 to 2023 at our institutions.

**Results:** Reoperation was performed in 10 (9.7%) of 103 bones. There was no correlation between reoperation-free survival and any of the following variables: preoperative and postoperative radiotherapy, site of bone metastasis, indication for surgery (solitary bone metastasis or impending or pathologic fractures), surgical method (intramedullary nailing fixation, curettage, or en bloc resection), preoperative embolization, or survival.

**Conclusion:** The risk of reoperation for bone metastasis of renal cell carcinoma does not appear to be based on the surgical method.

## Pathogenesis of recurrence of solitary bone cysts

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**Introduction:** Post-operative recurrence is an important clinical problem in solitary bone cyst (SBC) . In this study, we investigated the pathogenesis of SBC recurrence.

**Methods:** Seventy-six cases (56 males and 20 females, the median age was 13.7 years old) were included in this study. The affected sites were 26 humerus, 20 femur, and 30 calcaneus. The mean period of the follow-up was 27.7 months. After curettage, Hydroxyapatite and  $\beta$ -TCP were filled in 45 and 31 cases for bone defect. On the Baker classification (1970), incomplete healing (appearance of cysts larger than 1cm ) or greater was defined as recurrence. In addition to this radiographic evaluation, bone metabolism marker (TRACP-5b) in cystic fluid was measured to examine the association with recurrence of SBC using ROC curve.

**Results:** Sixteen long bones (femur and humerus) cases showed recurrence. No recurrence was observed in calcaneus cases. Focusing the site of recurrence, 14 cases relapsed, attaching to the growth plate. In the long bone cases, TRACP-5b showed AUC: 0.70, suggesting the involvement of osteoclast activity as the pathogenesis of relapse. Microscopic examination of the curettage materials was difficult to evaluate, because of the sparse presence of osteoclasts. In 7 cases of 16 relapsed cases, spontaneous re-ossification (re-mineralization) was achieved without surgery.

**Discussion:** Osteoclast played some parts of recurrence of SBC. But, classically, Jaffe & Lichtenstein (1942) proposed that the development of bone growth was locally impaired in SBC. This theory sounds attractive explanation for generating SBC relapse.

## Late-onset *Clostridium difficile* prosthetic joint infection following left distal femur osteosarcoma resection with autoclaved autologous bone and hinged knee prosthesis oncologic reconstruction: a case report

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**Introduction:** The authors report a rare case of late-onset *C. difficile* prosthetic joint infection (CD-PJI) in an 18-year-old Chinese patient. She previously underwent neoadjuvant chemotherapy, followed by distal femur osteosarcoma resection with biological oncologic reconstruction with an autoclaved autologous tumour-bearing distal femur bone segment and hinge knee prosthesis insertion, and subsequent extracorporeal irradiation. This was complicated by chronic nonunion of the autoclaved femur bone segment although the patient remained able to walk. Two years after index surgery, the patient developed acute afebrile and atraumatic left knee pain and effusion. The C-Reactive Protein (CRP) was elevated at 146mg/L, with purulent knee aspirates. A debridement, antibiotic and implant retention (DAIR) strategy was adopted with a single stage left knee arthrotomy, synovectomy, debridement and change of prosthetic insert. **Results:** *C. Difficile* was isolated from 3 separate intraoperative specimens. The patient was initiated on six weeks of intravenous vancomycin and oral metronidazole before de-escalation to lifelong oral penicillin. Eight months postoperatively, the CRP was within normal limits. The nonunion remained stable with small periprosthetic lucencies around the distal screws. No further intervention was required as the patient was independently ambulant and pain-free. **Discussion:** Distal femur autoclaved tumour-bearing bone oncologic reconstruction is prone to non-union and infection. Clinical vigilance for late-onset CD-PJI in oncologic patients is recommended, and may be managed with a DAIR strategy, thereby avoiding extensive revision surgery with good functional outcomes. Future treatment should aim to preserve remaining bone stock with good soft tissue coverage to optimise function in young patients.

## Malignant triton tumor of the distal femur

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Malignant triton tumors (MTT) are rare and highly aggressive malignant nerve sheath tumors with rhabdomyoblastic differentiation. The overall 5-year survival rate is extremely low, and no standardized treatment exists. A 16-year-old boy was referred to our hospital because of severe pain during physical activity and difficulty walking. He showed no café-au-lait spots or family history of neurofibromatosis 1. The patient underwent an incisional biopsy and was diagnosed with MTT of the distal femur. After administering preoperative chemotherapy with doxorubicin, ifosfamide, and cisplatin, wide resection surgery was performed for MTT. Subsequently, postoperative chemotherapy with methotrexate, in addition to the abovementioned agents, was administered. One and a half years after the surgery, the patient could walk without pain, and there were no signs of local recurrence or metastasis. The combined treatment modality of integrating chemotherapy and surgery prevented local recurrence and achieved favorable outcomes without lung metastasis.

## Kinabalu Ice Clasp: A case report on an adjunct composite recycled tumourized bone graft overlying an underlying vascularized bone graft – a reimplantation of a Campanacci III GCT of the distal tibia

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Giant cell tumour (GCT) of bone is an aggressive benign bone lesion. The tumour's juxta-articular location made treatment challenging, especially in Campanacci grade III. We present a case of a patient with a Campanacci grade III GCT distal tibia who has undergone limb salvage surgery using “Kinabalu Ice Clasp” technique. A comical coining of a name from “Kinabalu” an iconic mountain of the province with a combination of a composite clasp of a recycled bone graft using liquid nitrogen over an underlying vascularized fibula graft. The ankle swelling gradually increased in size and causing significant pain. Prior to this definitive surgery, the biopsy results revealed a Giant Cell Tumor of the distal tibia. Four doses of Denosumab were administered prior to surgery to facilitate consolidation of the tumour. Subsequently patient underwent an en bloc resection of the distal tibia. The defect was reconstructed using liquid nitrogen treated recycled diseased bone which was utilized to clasp-encase the transposed vascularized fibular graft. Reconstruction in a Campanacci III lesion with vascularized fibular, fortified with recycled bone graft is an economical & efficient method to enhance union & physical shielding of the underlying vascularized fibula graft while also serving as an extra scaffold for new bone incorporation. This method can be reproduced in other indicated case in the future. This reports our management and surgical methodology on this technique.

## Pedicled iliac crest bone graft vascularized by the deep circumflex iliac artery for femoral neck tumor

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**Introduction:** Biological reconstruction of bone defects in the femoral neck following curettage for benign bone tumor is challenging, and there is no established treatment strategy to date. **Methods:** The 4 patients with benign femoral neck tumor, mean age of 36.5 (20-50) years, who underwent a curettage followed by pedicled iliac graft vascularized by the deep circumflex iliac artery (DCIA) between 2001 and 2016 were enrolled. Three patients were males with giant cell tumor of bone and the remaining one patient was female with fibrous dysplasia. **Results:** All the patients presented with pain, but pathological fracture was not observed. The mean longest diameter of tumor was 57.8 (40-84) mm, and all the tumors were involved in the femoral neck. After the curettage of tumor and adjuvant treatment with phenol or liquid nitrogen, bony defect was filled with pedicled iliac crest continuing DCIA. Postoperative follow-up period was 42-60 months. Pathological fractures caused by accidental weight bearing were occurred in two cases within one month postoperatively. In these cases, one patient underwent bipolar femoral head arthroplasty. Another patient was treated conservatively, and full-weight bearing was permitted 8.5 months after his fracture. Femoral head necrosis had not been observed in all the cases. **Conclusion:** Filling the bony defect with living bone keeping mechanical strength had advantages in shortening of the period of limited weight bearing as a result of early bone union, preserving blood flow of the femoral head, and unnecessary of vascular anastomosis.

## Reconstructive surgical treatment of benign spinal tumors in children

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In the fields of modern orthopedics, oncology, and neurosurgery, surgical treatment of benign spinal tumors in children poses a unique set of challenges that call for a multidisciplinary approach. An in-depth analysis was conducted spanning two decades from 2001 to 2021 to investigate the treatment outcomes of 301 young patients aged 1.5 to 18 years diagnosed with benign spine tumors. All patients underwent a comprehensive examination and received surgical intervention tailored to factors such as tumor localization, lesion volume, pain presence, neurological manifestations, and the risk of pathological fractures. The clinical and radiological profiles were studied, highlighting specific characteristics regarding the course of the pathological process in benign tumors and tumor-like conditions in pediatric cases. While the current focus in oncology is primarily on malignant tumors, the surgical principles for benign tumors demand techniques that are distinct and call for a nuanced, personalized approach based on the specific diagnosis and the activity of the pathological process. Advancements in modern implantation methods have significantly reduced the need for bone grafting, leading to reduced risks of long-term postoperative complications, particularly in pediatric patients. Based on the gathered data, an algorithm to guide the selection of surgical treatment for patients with benign spinal tumors was developed. The algorithm not only aids in determining the most appropriate resection method, but also assists in selecting optimal fusion and bone grafting techniques, contingent on the tumor type and the child's growth potential.

## Inter-ilio-abdominal disarticulation, case series experience in Chondrosarcoma – Management details

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INTRODUCTION: Minimizing the risk of complications after this rare and severe operation. METHODS: 80 patients with primary tumors of the pelvic region were treated, in our hospital (1). We will refer only to the Inter-ilio-abdominal disarticulation for the chondrosarcoma – 7 cases. The diagnostic was obtained by incisional biopsy, after complex imagistic investigations: pelvic CT and MRI, Bone Scintigraphy, Thoracic CT, Pelvic X-ray. RESULTS: We will present all the pre-, intra- and postoperative details. Several complications were recorded in 2 patients. No neurological complications were present in this series. Other complications were recorded at a variable rate. Likewise, visceral lesions were not detected in any of our patients, neither intra-, nor postoperatively. In two patients, a moderate lumbago was present. The functional assessment was performed according to the MTS (Musculoskeletal Tumour Society) criteria. CONCLUSIONS: The inter-ilio-abdominal amputation is a difficult surgical procedure for the surgical team and for the patient, as well as technically exhausting and requires a good preparation and warning of both the surgeon and the patient about the high incidence of complications. If the problems are overcome, the treatment offers the patient the best functional result and contributes to the improvement of the quality of his life. The quality of treatment by this method is undertaken by the effort of a multidisciplinary team, which possesses the necessary experience and technical equipment in the field of bone tumours.



## Comparison of pre-operative and post-operative radiotherapy in patients with localized myxoid liposarcoma

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**Background:** Myxoid liposarcoma is more radiosensitive than other soft tissue sarcomas, and radiotherapy has been reported to reduce tumour size. This study was performed to compare the rates of local recurrence, survival and wound complications between pre- and post-operative radiotherapy for localized myxoid liposarcoma. **Methods:** From the Japanese Nationwide Bone and Soft Tissue Tumor Registry database, 200 patients with localized myxoid liposarcoma who received pre- (range, 30-56 Gy) or post-operative (range, 45-70 Gy) radiotherapy and surgery were included in this retrospective study. Propensity score matching was used to adjust for background differences between patients who received pre- and post-operative radiotherapy. **Results:** Local recurrence occurred in five (5.0%) and nine (9.0%) patients in the pre- and post-operative radiotherapy groups, respectively (both n = 100). The median follow-up time from diagnosis was 40.5 months (IQR, 26.3-74). Univariate analysis showed a similar risk of local recurrence between the pre- and post-operative radiotherapy groups (5-year local recurrence-free survival 94.9% [95% CI 87.0-98.1] vs. 89.0% [95% CI 79.6-94.3]; P = 0.167). Disease-specific survival was similar between the pre- and post-operative radiotherapy groups (5-year disease-specific survival 88.1% [95% CI 75.5-94.6] vs. 88.4% [95% CI 77.3-94.5]; P = 0.900). The incidence of wound complications was similar between the pre- and post-operative radiotherapy groups (7.0% vs. 12.0%; P = 0.228).

**Conclusions:** There was no difference in local recurrence, survival or incidence of wound complications between pre- and post-operative radiotherapy for localized myxoid liposarcoma. Therefore, pre-operative radiotherapy for myxoid liposarcoma provides clinical results equivalent to post-operative radiotherapy.

## Diagnostic Dilemma between Telangiectatic Osteosarcoma (TOS) & Aneurysmal Bone Cyst.

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**Introduction:** Telangiectatic osteosarcoma (TOS) of the spine is rare accounting only 0.086% of all primary osteosarcomas. In Bangladesh there is no case report of TOS. We describe the clinical, radiological and pathological features and discuss the treatment option of TOS of the lumbar spine presenting in a young man.

**Aim of the study:** To present such a rare case like TOS and make awareness about its diagnostic dilemma.

**Patient and Method:** It is an observational study. The study was conducted in Department of orthopedics and Spine Surgery in Ad-din Women's Medical College & Hospital during the period of August, 2014 to August, 2019. We did X-RAY, MRI of lumbar spine & CT angiogram & biochemical tests. MRI reveals aneurysmal bone cyst (ABC). Then we operated the patient & tissue histology report was in favour of ABC. After 6 month of surgery patient came back with recurrence of symptoms. Repeated X-ray was done revealing radiological feature like sunburst appearance. Tissue biopsy was done again report reveals osteosarcoma (Telangiectatic osteosarcoma of spine). Then the patient was treated by oncologist and got the treatment like chemotherapy & radiotherapy. Patient survived for 5 years.

**Result:** Though we passed through the roads of diagnostic difficulties, at last we reached the correct diagnosis through which patient got the available treatment.

**Conclusion:** The dilemmas associated with the diagnosis of TOS has been emphasized in literature. In particular as ABC is almost indistinguishable from TOS on radiograph. Hence the correct diagnosis rest on a careful histological examination.

## Striving for Excellence to improve outcome: Surgical management for locally aggressive benign bone tumors.

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Benign aggressive bone tumors include: giant cell tumors, chondroblastomas, unicameral bone cyst, and aneurismal bone cyst. They are tumors that rarely metastasize, but are locally aggressive and frequently recur. That is why they pose a unique challenge in the realm of orthopedic surgery, requiring meticulous planning and execution to achieve optimal outcomes. The pursuit of excellence in this context encompasses various aspects, including accurate preoperative diagnosis through imaging and biopsy techniques, surgical planning tailored to tumor characteristics and patient factors, and cutting - edge surgical techniques. Additionally, multidisciplinary collaboration among orthopedic surgeons, oncologists, radiologists and pathologists plays a crucial role in optimizing patient care and treatment outcomes. Intraoperatively, the goal is to achieve complete resection of the tumor while preserving surrounding structures, to maintain optimal function and reduce postoperative morbidity. Various surgical techniques may be employed, but they all have the same goal - to improve the patient's quality of life. In our institution, we have diagnostic protocols for musculoskeletal neoplasms. The purpose of this study is a preview of diagnostic protocols and their implementation in our daily medical practice by presenting a case report of 21 year old female patient with osteoblastoma and secondary aneurismal bone cyst in the distal part of the right femur, giant cell tumor in the proximal part of the right tibia and osteolysis in the proximal part of the right fibula.

Keywords: locally aggressive benign bone tumors, surgical management

## Total modular hip arthroplasty for fracture in pathological terrain secondary to fibrous dysplasia. Presentation of a clinical case and literature review.

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Fibrous dysplasia (FD) is a benign tumoral condition in which normal bone is replaced by structurally deficient fibro-osseous laminar bone. It represents approximately 5-7% of benign bone tumors and occurs in two presentations: monostotic, which is the most common, and polyostotic. The proximal femur is one of the most common locations for benign tumors. Pathological fractures are often the first symptom. In the context of a proximal femur fracture with a benign tumor, indications for total femoral resection include multiple lesions in the femur or primary diaphyseal tumors, lesions that extend proximally and distally beyond the metaphyseal junction and do not allow for adequate joint preservation. Currently, proximal or total femoral resection and endoprosthetic replacement using modular megaprosthetic systems are considered good therapeutic options. We present the case of a 27-year-old male patient who presented to the emergency department with a basicervical fracture of the right femur in pathological terrain, following a low-energy injury mechanism characterized by axial loading with a rotational component of the right pelvic limb. The patient had a history of osteosynthesis in that region 20 years prior, as well as a biopsy that reported FD and subsequent removal of osteosynthesis material one year later. Due to the characteristics of the fracture and as a definitive and curative therapeutic method, it was decided to perform extensive resection of the proximal femur and total hip arthroplasty with modular prosthesis placement and cerclage, as well as excisional biopsy, which later confirmed that it was fibrous dysplasia treated in childhood.

## Prognostic Factors Influencing Patient Survival and Local Recurrence Rates in Myxofibrosarcoma: A Sarcoma Center Experience

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Myxofibrosarcoma presents an infiltrating growth pattern that results in a high tendency for local recurrence as clear margin resection is challenging because of microscopic infiltration. The purpose of the present study is to analyse the overall survival rates of patients, along with their disease-free survival and the prognostic factors that determine both survival and disease recurrence outcomes. The five-year overall survival rate was 65.5 %. The age of more than 65 years (OR=5.14 [95% CI: 1.89 - 13.98];  $p < 0.001$ ), the size of more than 5cm (OR=3.24 [95% CI: 1.02 - 10.23];  $p = 0.045$ ) and the G3 tumor grade (OR=4.70 [95% CI: 1.88 - 11.73];  $p < 0.001$ ) were shown to affect negatively the overall patient survival. The five-year recurrence-free survival rate was 49.4 %. The type of resection in terms of residual tumor classification (OR=2.38 [95% CI: 1.00 - 5.64];  $p = 0.048$ ) was shown to affect negatively the tumor recurrence. Clean margins had a positive impact on recurrence-free survival, however, did not significantly affect overall patient survival, suggesting that other factors may play a more significant role in determining patient outcomes. A surgical margin of 2mm was not sufficient to significantly influence the incidence of recurrence. Consequently, a wider surgical margin may be necessary to reduce the risk of tumor recurrence.

## Lung Cancer and Bone Metastasis with Leukemic Transformation in Myelodysplastic Syndrome (MDS): A Case Report

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**Objective:** While there are many case reports of MDS secondly associated with lung cancer during chemotherapy, reports on lung cancer with primary MDS are rare. We report a rare case of lung cancer and bone metastasis diagnosed during the treatment course of MDS. **Case :** A 63-year-old male. During chemotherapy of MDS, a lung tumor was detected on a simple CT scan. One month later, magnetic resonance imaging (MRI) revealed a few spinal lesions which clinically diagnosed multiple bone metastasis of lung cancer. No therapy of lung cancer was provided because of poor prognosis. Although the lung lesions were not increased on imaging, the progression of leukemia was accompanied by new spinal metastases and lesions in the right ilium which increased rapidly. **Results:** At the time of death, imaging diagnostics and pathological autopsy showed slight enlargement of the primary lung cancer and increased size of spinal and iliac bone metastases. The autopsy revealed that extensive infiltration of leukemia cells in the alveolus walls caused respiratory failure. The histopathological subtype of the lung cancer was adenocarcinoma. The thoracic vertebral lesions within leukemia-infiltrated bone marrow were diagnosed with bone metastases from lung adenocarcinoma. **Discussion:** Previous studies have suggested a correlation between the size and number of primary and metastatic lesions. In this case, the progression of leukemia coincided with rapid development of bone metastasis, though the untreated primary lung lesion did not increase significantly. It was suggested that bone metastasis developed more rapidly in leukemic bone marrow than normal bone marrow.

## Non-surgical biopsy: limits and indications

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Introduction: 30 or 40 years ago we could not see as many bone and soft tissue tumors as today; the population has tripled or even quadrupled; the environment and food are becoming more and more carcinogenic; genetic mutations whose mystery no one has yet solved; have all resulted in this increase putting the orthopedist specializing in tumors faced with a large number of patients requiring histological proof to consider adequate treatment. He therefore often resorts to scan or ultrasound-guided biopsy puncture; but is this valid for any suspicious lesion? Materials and methods: in our work we present a number of clinical cases having benefited from a percutaneous biopsy. Results: good indications necessarily lead to good results and consequently to good care. Discussion: the recommendations of the pathologists of the bone tumor reference network left little doubt regarding the choice of the type of biopsy. Conclusion: any biopsy decision, whether surgical (incisional or excisional) or percutaneous, must respect the RESOS criteria but also go through a multidisciplinary consultation meeting.

## Importance of surgery in the management of patients with spinal tumors – single center experience

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### Introduction:

Tumors that involve the spinal column are mostly metastases of visceral organ tumors. They are initially diagnosed by radiological imaging (CT, MRI), and definitively pathohistological. Treatment options are single tumor reduction, tumor reduction with decompression of the spinal canal and stabilization, and vertebroplasty. The gold standard of surgical treatment is posterior instrumentation with decompression.

### Materials and methods:

We present 18 patients with spinal tumors who underwent surgery in the Department of Spine Surgery of the University Clinical Center of Serbia from 1st January 2023 till 1st January 2024.

### Results:

From 18 patients, involvement of the cervical spine had no one, the thoracic spine was involved in 7(38.9%) patients, and the lumbar spine in 11(61.1%) patients. Preoperative neurological finding was ASIA-E in 13(72.3%) patients, ASIA-A in 1(5.5%) patient, ASIA-B in 3(16.7%) and ASIA-C in 1(5.5%) patients. Single tumor reduction was done in 2(11.1%) patients, in 12(66.7%) patients were done tumor reduction with decompression of the spinal canal and stabilization, and in 4(22.2%) patients vertebroplasty. Postoperative, 2(11.1%) patients had neurological improvement. There were 6(33.3%) male patients and 12(66.7%) female patients. The age distribution was as follows: 19-24 (0), 24-44 (3), 44-65 (7), 65-80 (8), >80 (0). Metastases were most frequently from lung carcinoma (6 (33.3%) patients).

### Conclusion:

Multidisciplinary management is a must in patients with spinal tumors, but surgery has mostly the main role as the cornerstone for further treatment, as well as in the improvement of the quality of life of these patients.



## Surgical treatment of patients with malignant bone tumors using modular endoprostheses with custom-made short stems

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Introduction: In cases of subtotal long bone tumor lesions, localization of malignant tumor near joint or implant instability, endoprostheses with custom-made short stems allow limb-salvage surgeries.

Aim: To evaluate early results of modular endoprostheses with custom-made short stems in limb-salvage operations.

Patients and Methods: Radical limb-salvage operations were performed in 8 patients aged 19 to 75 years. Malignant tumors were presented as chondrosarcoma in 3 cases, metastasis, adamantinoma and fibrosarcoma – one each, in 2 cases it was implant instability. We operated on tibia 4 times, on femur 3 times, on humerus once. Based on the results of multi-slice CT, custom-made short stems compatible with modular endoprostheses were designed and manufactured. Subtotal resections of proximal parts of humerus or tibia were performed once each, segmental diaphyseal resections in three. All short stems but one were locked with screws. In 4 cases untrashort stems were manufactured with massive extra-cortical plates. Twice stems were designed for cementless fixation. Length of resection ranged from 120 to 310 mm. Follow-up ranged from 1 to 5 years.

Results: We observed 1 progression in the case of metastasis, there was no deep infection or implant loosening by the end of the follow-up. The integrity of the implants was not violated in any case. MSTS score ranged from 89 to 95% in cases of diaphyseal resections, for subtotal resection of tibia – 88%, humerus – 80%.

Conclusion: The use of modular endoprostheses with custom-made short stems is a promising trend in orthopaedic oncology.

## From Sacral to Tibial: Metastatic evolution of chordoma after 7 years

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Sacral chordomas are malignant tumors that arise from remnants of the notochord, which are usually located in the sacrum. These tumors represent less than 5% of all primary malignant bone tumors. Sacral chordomas are characterized by their slow-growing nature and aggressive local invasion. Surgical resection remains the cornerstone of treatment for sacral chordomas, aiming for complete excision of the tumor while preserving neurologic function. However, in some cases, chordomas can spread to distant sites like the liver, the lungs or the bones, leading to metastatic disease which is rare, but significant clinical challenge in the management of this disease. Given the rarity of tibial metastases from sacral chordoma we present a case of a 51-year-old male with sacral chordoma, surgically treated with partial sacrectomy and coccygectomy. After the surgery, the patient experienced a period of remission and no evidence of recurrence on follow-up imaging. Nonetheless, seven years after surgery, the patient presented with pain in the left tibia. After thorough evaluation, imaging techniques, and open biopsy, spinal chordoma metastases were confirmed. The patient was surgically treated using the Masquelet technique. In the first act wide resection of the tumor was made, the bone was reconstructed with antibiotic methymetacrilat and osteosynthesis with LCP plate and eight screws was made. Two months after the first surgery in the second act the patient was surgically treated with extraction of the antibiotic metylmetacrilat, reconstruction of the bone with autograft spongioplasty from the iliac crest and osteosynthesis with LCP plate and six screws.

## Functional Outcomes Following Hemi-Arthroplasty After Resection Of Proximal Femur Tumors

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Acetabular erosion by the head of a proximal femur hemiarthroplasty causing pain has been a matter of concern which may require acetabular resurfacing, especially in young adults. Proximal femoral replacements have a reported dislocation rate of 4-35% when the acetabulum is replaced (total hip arthroplasty). Dislocation rates are reportedly lower with hemiarthroplasty.

### Objectives

To evaluate functional outcomes following hemi-arthroplasty after wide resection of proximal femur tumors.

### Study Design & Methods

A study was conducted in patients with malignant or benign aggressive tumors of proximal femur undergoing wide resection and reconstruction with bipolar proximal femur endoprosthesis without acetabular resurfacing (hemiarthroplasty) between June 2017 and June 2019. Functional evaluation was done using MSTS 93 score and gait analysis.

### Results

There were 7 female and 16 male patients. Mean age was 28.4 years (Range 16 – 58 years). Mean follow up was 22.56 months (Range 12 – 42 months). We found dislocation of the prosthesis in only two patients, both occurring within one month of index surgery, and deep infection in only one patient. The mean MSTS score was 24.91, with 95.6% reporting an excellent or good functional outcome with minimal restriction in walking ability, minor gait alteration and minimal pain at last follow up.

### Conclusions

Larger head size provides more stability. Bipolar head allows motion in 2 planes thereby reducing acetabular wear. Sacrifice of abductor attachment results in trendelenberg gait and reduction in joint reaction forces, which also results in lesser acetabular wear

**Keywords:** Proximal Femur Replacement, Hemi-Arthroplasty, Proximal Femur Tumors

## Synovialosarcoma of the knee. About a case

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Synovialosarcoma of the knee. About a case

Introduction :Synovialosarcoma is a rare malignant tumor with a poor prognosis. It represents 5 to 10% of soft tissue sarcomas. Its recognition is facilitated by immunohistochemical methods.

However, the confirmatory diagnosis is histological. Surgery constitutes the main therapeutic

modality while radiotherapy and chemotherapy provide better local control. Materials and methods :

Patient aged 28, who presents pain in the posterior aspect of the right knee with a mass in the

popliteal fossa.MRI: A multifocal tumor at the level of the popliteal fossa. Extrinsic compression of

the popliteal vein, without invasion. Absence of femoropopliteal arterial invasion. Intimate lesional

contact with the fibular and tibial nerve. Patient underwent a biopsy which came back in favor of

synovialosarcoma, followed by a wide resection of the tumor and adjuvant chemotherapy Results :

After 2 years no recurrence Conclusion : Synovialosarcoma is a rare tumor that is difficult to treat.

Large surgery is the capital element of the treatment, thus imposing joint sacrifice and compromising

the function of the limb. The prognosis is dominated by the risk of local recurrence and metastases,

especially pulmonary metastases, requiring close monitoring and multidisciplinary collaboration.

## Nodular Fasciitis of the Leg. About a Case

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Introduction : Nodular fasciitis is a benign lesion with rapid proliferation of myofibroblastic cells, which develops at the expense of muscular fascia within the subcutaneous tissue. The usual locations are the trunk (48%) and the upper limb (20%), but unusual locations have been described. Materials and methods : This is a 12-year-old child who presents with swelling on the inner side of the left leg that has been present for several months. MRI reveals a non-invasive circumscribed tumor mass juxtaosseous on the internal face of the middle segment of the leg without bone lesion. A biopsy is performed. After anatomo-pathological examination, the diagnosis was nodular fasciitis. The child underwent surgical excision of the mass Results : Anatomo-pathological study: nodular fasciitis After a 6-month follow-up, no recurrence Conclusion : Nodular fasciitis is a benign lesion, so it is important to perform histological examination by experienced pathologists to avoid an erroneous diagnosis of sarcoma.

## A Rare Case of Phosphaturic Mesenchymal Tumour Distal Femur in A Young Female

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Phosphaturic Mesenchymal Tumours (PMTs) are unique and rare bone neoplasms, posing diagnostic challenges due to the diverse clinical presentations. We present a case of a 37-year-old female school teacher who underwent successful surgical management for a PMT (phosphaturic mesenchymal tumour) localized in the distal femur. Key diagnostic indicators included hypophosphatemia, hyperphosphaturia, and elevated fibroblast growth factor-23 levels, accompanied by clinical symptoms indicative of osteomalacia.

The case was managed surgically with the resection of the tumour and limb salvage surgery with megaprosthesis. The postoperative period was uneventful, leading to a stable discharge. On follow up, no signs of recurrence were found, patient became fully ambulant and was pain free, continued to comfortably work as a teacher. This case underscores the significance of considering PMT in patients presenting with unusual clinical symptoms along with hypophosphatemia, hyperphosphaturia, and osteomalacia.

## Management of Pathological Distal Femur Fracture in Genochondromatosis: An Intramedullary Approach

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In this case of genochondromatosis, a rare condition marked by symmetrical enchondromas, a young patient sustained a pathological distal femur fracture. Faced with the challenges of altered patient anatomy, a lack of literature on management strategies, and limited implant options, the medical team opted for a pioneering approach. Utilizing an intramedullary device, specifically a distal femur nail, proved to be the key. This strategy provided enhanced stability, spanning the entire femur and ensuring optimal healing potential. Through meticulous pre-operative evaluation and adherence to fundamental fracture management principles, including comprehensive bone coverage, successful fracture union was achieved. Over the course of twelve months, the patient was diligently monitored, ultimately regaining complete range of motion, and returning to functional levels akin to those before the injury. This case not only underscores the vital importance of tailored, innovative methodologies in addressing rare pathological fractures but also paves the way for future advancements in the realm of orthopaedic care.

## Chondrosarcoma of the humerus. About a case

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Introduction : Chondrosarcoma is the second primary malignant bone tumor in adults after osteosarcoma. It represents approximately a quarter of all bone sarcomas and constitutes a heterogeneous group of neoplasias characterized by the production of a cartilaginous matrix.

Materials and methods : 33-year-old patient who consults for painful swelling in the left arm that is rapidly progressing. MRI: A large malignant osteolytic mass in the left arm. The brachial artery and veins are permeable in contact with the tumor. The patient underwent a biopsy revealing a grade 2 chondrosarcoma, followed by a wide resection and reconstruction with acrylic cement and a screw plate. The patient received neoadjuvant chemotherapy Results : Histological study confirms the diagnosis of grade 2 chondrosarcoma After 2 years, no recurrence. Conclusion : Chondrosarcoma is a primary malignant tumor of the cartilaginous lineage. This is a heterogeneous group of tumors that can be characterized by their location in the bone (intramedullary, conventional chondrosarcoma, or on the surface of the bone). Chondrosarcomas are not chemosensitive and are relatively resistant to radiotherapy. Their treatment currently remains based on surgical resection. Recent biological characterization work suggests possibilities for adjuvant medical treatment.



## Intramuscular angioma of the hand. About a case

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Introduction : Intramuscular hemangiomas are benign tumors representing less than 1% of all hemangiomas. Many therapeutic procedures are proposed for the treatment of these tumors but surgery remains the most recommended. The outcome is often favorable when the resection is complete. We report a case of intramuscular hemangioma of the interdigital space of the 2nd -3rd finger. Materials and methods : Patient aged 22 who consults for painful swelling in the interdigital space of the 2nd -3rd finger that has been present for 6 months MRI: Subcutaneous formation of the palmar side of the root of the 3rd finger, straddling the interdigital space of the 2nd -3rd finger, hypervascularized measuring 11\*17\*15 mm The patient underwent a biopsy revealing an intramuscular angioma followed by a wide resection. Results : Histological study confirms the diagnosis of an intramuscular angioma After 1 year, no recurrence. Conclusion : Hemangioma is a common benign vascular tumor whose intramuscular location remains rare. MRI is essential for the positive and differential diagnosis of this lesion, for which surgical excision ensures healing.

## Myxofibrosarcoma of the forearm. About a case

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Introduction : Myxofibrosarcomas are malignant connective tumors, whose extremely frequent recurrences jeopardize the local and general prognosis. Even when the surgical excision appears macroscopically complete, it is very often microscopically infiltrated. Materials and methods : 83-year-old patient who consults for painful swelling in the left forearm that is rapidly progressing. MRI: a tumor mass in the upper extremity of the left forearm affecting the lateral aspect without signs of extension to the elbow joints and without vascular invasion measuring 44\*30\*60 mm A biopsy was performed, coming back in favor of Myxofibrosarcoma. The patient benefited from a wide resection followed by a course of neoadjuvant radiotherapy Results : The histological study confirms the diagnosis of low-grade myxofibrosarcoma. After 3 years, no recurrence. Conclusion : Myxofibrosarcomas are tumors that are difficult to completely resect immediately due to their infiltrative nature, which is often underestimated before the operation. Their surgical treatment requires much wider resection margins than predicted by clinical evaluation and MRI. In case of incomplete resection, surgical revision must be done systematically.

## Extraskelatal Myxoid Chondrosarcoma, A Mass On Shoulder, A Rare Location: A Case Report

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Extraskelatal myxoid chondrosarcoma (EMC) is a rare soft tissue tumor that usually affects the lower limbs of men between the ages of 50 and 60. In this case, we report a 54-year-old female patient with painless swelling on her right shoulder for 3 months. A fine needle aspiration biopsy at another center was reported as round cell liposarcoma at first. Upon physical examination, the mass was mobile, uniform, and nontender. The shoulder range of motion was complete with no neurovascular disturbance. No significant clinical signs and symptoms such as fever, weight loss, and respiratory symptoms were noted. She was recommended an excisional biopsy and further immunohistochemical examination. Incision on right shoulder posterolateral side was made to include the biopsy tract and the mass was removed en bloc. Surgical borders were reported as tumor free and specific markers were as follows; CDK4, MDM2 amplification and solid tumor panel came out as negative. 88.79% fusion was detected between exon 4 of SMRCA2 and exon 3 of NR4A3 genes and this fusion was reported as EMC. PET-CT showed no metastasis. The tumor was treated with wide resection followed by radiation therapy. The condition was cured as the follow up exceeded 12 months. EMC, a rare soft-tissue mass, can present in atypical locations and may be misdiagnosed. To the best of our knowledge, this is one of the very rare locations to encounter such tumor. Radiographic assessment of osseous and soft tissue abnormalities should consider EMC as a differential diagnosis regardless of its anatomical location.

## Giant cell tumors of the lower end of the radius. About a case

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Introduction : Giant cell tumors (GCT) are benign tumors of the metaphyso-epiphyseal region of long bones. It is a lytic tumor, very recurrent, sometimes with invasion of soft tissues and can be locally aggressive. It affects young adults between 20 and 40 years old. Involvement of the lower end of the radius represents the third location. Its treatment is mainly surgical, either by extensive curettage, or by en bloc resection of the affected bone segment with radiocarpal arthrodesis reconstruction.

Materials and methods : 36-year-old patient who consults for painful swelling in the lower third of the right forearm that has been present for 4 months MRI: single blowing osteolytic lesion in the distal epiphyseal of the radius measuring 7\*6 cm with cortical lysis infiltrating the soft parts. The patient underwent a biopsy revealing a giant cell tumor followed by a wide resection and radiocarpal arthrodesis reconstruction. Results : Histological study confirms the diagnosis Giant cell tumor After 2 years, no recurrence. Conclusion : GCTs are tumors that are sometimes benign and sometimes malignant. The bottom of the radius is the 3rd frequency location. Curettages are rarely followed by success in this localization of the TCG due to the invasion of the soft tissues and the destruction of the articular surface which occurs early. Resection in TCG of the wrist is much more often mandatory than in other locations. It is indicated in recurrences of curettage-filling and in large tumors invading the soft tissues as well as in failures of curettage-filling.

## Giant cell tumor of the thoracic spine : surgical strategy

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Bone giant cell tumors (GCT) are lytic lesions, very recurrent and often benign. Apart from the sacrum, the spinal localization of GCT is exceptional. The severity of these lesions is dominated by recurrences, malignant degeneration and neurotoxicity. The purpose of this observation is to recall the clinical and radiographic picture of these tumors, and to discuss the treatment strategy. We report the case of a 36-year-old patient with no specific history who presented with thoraco lumbar pain evolving for 3 months. She reported progressive worsening associated with gait disorders and a neurological status Frankel C. MRI showed an expansive process in T1 hyper signal and T2 iso signal with spinous process compression and invading the posterior arc of the T12 vertebra. Regarding the neurological emergency we opted for a first decompression with left Trans-pedicular biopsy. The pathological examination was in favor of GCT. The therapeutic strategy was to make, at first, a thoraco-lumbar fixation and a complementary resection by posterior route. A month later, an approach of the tumor by a thoracotomy centered on the 10th rib was performed. A block resection was done by carrying the vertebral body of T12 and the two discs above and below. A graft prepared from the 10th rib was embedded in the form of vertical rods. The evolution was marked by neurological and functional recovery. The GCT of the dorso lumbar spine are exceptional, their clinical and radiographic data is not specific. In case of damage to the body and posterior arch, a total vertebrectomy should be performed to minimize the risk of recurrence.

## Epstein-Barr Virus Associated Smooth Muscle Tumour Involving Bone: A Rare Case of painful bony lesions in Systemic Lupus Erythematosus

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Epstein-Barr virus associated smooth muscle (EBV-SMT) tumour is an exceedingly rare entity in oncology. In adults, its occurrence is associated with underlying secondary immunodeficiency caused by Human Immunodeficiency Virus infection or after solid organ transplantation immunosuppression therapy. In children, the tumours usually develop in patients with primary immunodeficiency disorders. They usually presented as soft tissue masses or lesions which could raise the suspicion of neoplasm. There are no optimal guidelines or protocols for the treatment of such tumours. We share an unusual case of a patient with systemic lupus erythematosus, presented with chronic severe pain in the left hip and knee due to EBV-SMT involving the left femoral head and left distal femur bone, which was successfully treated with surgical decompression alone.

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## Tenosynovial giant cell tumour of Patellar Tendon- A case report and review of Literature

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Tenosynovial giant cell tumour of the Patellar Tendon is a rare entity reported in the literature. We report a case of a 22-year-old female who noticed pain and swelling in the knee joint for the last 5 months. Medical consultation was sought, and Magnetic Resonance Imaging (MRI) showed a nodular swelling in the anterior aspect of the knee joint. She underwent arthroscopic excision biopsy. Histopathological evaluation showed a tenosynovial giant cell tumour. Literature analysis showed few case reports. She subsequently became asymptomatic and is under follow-up.

## Oncogenic osteomalacia with 'culprit' lesion in the femoral head managed by en-bloc excision and femoral head preservation under intraoperative CT navigation- A Case report

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**Introduction:** Oncogenic osteomalacia or Tumor-induced osteomalacia (TIO) is a rare paraneoplastic syndrome. We report the first case of TIO in the femoral head successfully treated with computed tomography (CT) guided wide en-bloc resection of the tumor. **Case presentation:** A 35-year-old male presented with complaints of low backache and bilateral hip pain for 3 years. Laboratory parameters revealed elevated levels of alkaline phosphatase (391.3U/L) and low levels of phosphorus (2.01mg/dl), and Vitamin D 25OH (16.3ng/ml). Hypophosphatemia was further evaluated by screening for FGF23 which was positive (155 RU/ml). Radiographs of the pelvis showed insufficiency fractures in the bilateral femoral neck and diffuse osteopenia. MRI of the pelvis with both hip joints and spine revealed diffuse osteopenia of the pelvis, un-displaced acute stress fracture of the bilateral femoral neck. 68Ga DOTANOC whole body scan revealed head of left femur suspicious for possible primary site for tumor induced osteomalacia. The tumor was excised en-bloc and confirmed again by CT. The void was filled with bone cement. The specimen sent for histopathology showed features of spindle cells consistent with a phosphaturic mesenchymal tumor. The patient phosphorous levels resumed to normal levels at first week review and improvement in the clinical symptoms without any further phosphorous supplements. **Conclusion:** Tumor-induced osteomalacia (TIO) is a rare debilitating disease and a step wise approach helps in localization of the 'culprit' lesion. TIO should be kept as a differential diagnosis in patients with generalized weakness and low phosphate levels.



## Highlighted Features of Extremity Soft Tissue Sarcomas Observed in Syrian Refugees

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**Introduction:** Sarcoma is of mesenchymal origin and describes a heterogeneous group of malignant tumors. It accounts for less than 1% of adult cancers and 10-20% of adolescent and young adult cancers. Although there is partial data on the sarcoma subtypes in our population, we have no data on immigrants. In this study, we aimed to present data about the demographic, sarcoma subtypes, localizations and prominent features of the patients. **Material and Method:** We determined the sarcoma distribution of Syrian immigrant patients who applied to the orthopedics and plastic surgery outpatient clinics of Adana City Hospital between 2018 and 2023. The data of these patients were accessed using the IT archive, hospital conventional archive system and surgery notebooks. Patients whose histopathological diagnosis was confirmed and whose full information was available were included in this study. **Results:** For 56 patients included; the average age was 22.4 and 32 of them were female. The most and least common sarcoma was synovial sarcoma (17/56, 30%) and Infantile fibrosarcoma (7/56, 12%) respectively. Regardless of subtype, the most common site was the lower extremities (40/56, 71%). The average size was 18 cm. **Conclusion:** Despite of the large volumes, metastases were detected in only 7 of them at their first admission. Remaining cases were "locally advanced disease" group. Although imaging methods showed signs of malignancy, histopathologically they were benign. The average age of these patients was lower than normal. **Key words:** Sarcoma, extremity, Syrian refugee

## Liposarcoma of the leg. About a case

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Introduction : Liposarcoma is a malignant soft tissue tumor of mesenchymal origin developed from lipoblastic cells at different stages of their differentiation. The clinical diagnosis, sometimes late, is dominated by the appearance of a palpable tumor most often associated with pain; the anatomopathological examination makes it possible to provide the diagnosis with certainty. The basic treatment remains cancer surgery supplemented by radiotherapy and possibly chemotherapy.

Materials and methods : Patient aged 52 who consulted for painful swelling on the posterior surface of the left leg that had been present for 6 months MRI: a tumor mass in the soleus muscle of the left leg measuring 89\*54\*95mm. Arteries and veins of the left leg network are permeable. A biopsy was done at her home, coming back in favor of liposarcoma. The patient underwent a wide resection followed by a course of chemotherapy. Results : Histological study confirms the diagnosis of liposarcoma. After 1 year, no recurrence. Conclusion : Liposarcomas of the limbs are rare tumors which represent numerous diagnostic and therapeutic difficulties. The histological diagnosis must be made precisely. Surgery constitutes the cornerstone of treatment, respecting oncological rules, and may be the only therapeutic alternative, often with significant functional damage.

## Trochanteric fracture in Kahler's disease: about a case

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Introduction : Multiple Myeloma or Kahler's disease is a tumor proliferation of monoclonal plasma cells in the bone marrow. It represents approximately 1% of all cancers and 10 to 12% of hematologic malignancies. It primarily affects the skeleton and classically manifests itself as bone pain (90%).

Sometimes, Myeloma is discovered in the context of an orthopedic emergency.

Materials and methods : 48-year-old patient followed for multiple myeloma, who presents with a complex trochanteric fracture following a fall from height. CT scan: complex pathological comminuted left trochanteric fracture on diffuse hemopathy of the multiple myeloma type. The patient underwent

osteosynthesis using a nail plate. Results: After 06 months of evolution, the functional result is satisfactory.

Conclusion : Multiple myeloma is a very polymorphous condition on a clinical and biological level. Its discovery is most often at an advanced stage and sometimes during certain

complications. CT allows exhaustive exploration of bone lesions due to multiple myeloma, and relief of the surgical indication through precise study and classification of the fracture.

## Use of Photodynamic Bone Stabilization of the Pelvis and Lower Extremity Alters Opiate Pain Requirement and Ambulatory Status in Patients with Metastatic Bone Disease

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Metastatic bone disease (MBD) places patients living with cancer at risk for pathologic fracture and increased pain. Those at risk for fracture or those with fracture often undergo surgical stabilization or resection. The IlluminOss photodynamic bone stabilization system has enabled faster recovery, decreased soft tissue stress, and early weight bearing. We sought to answer the following questions: After fixation with the IlluminOss, do patients with MBD experience decreased pain? How does their weightbearing status alter after surgical fixation? This is a retrospective case series of patients who underwent fixation with the IlluminOss photodynamic bone stabilization system in the pelvis and long bones for metastatic bone disease. Information was collected on follow-up, primary tumor histology and operative factors. Pain requirement and ambulatory status was noted pre-operatively and post-operatively. The Musculoskeletal Tumor Society (MSTS) scoring system was used to assess functional outcomes. There were 11 patients analyzed with an average age of 66 years and an average follow-up of 8 months (Table 1). The average post-operative day at discharge was eight. Nine (82%) patients received pre-operative embolization. Pain requirement was calculated as morphine milligram equivalents (MME). MME per day was significantly lower post-operatively (p 0.02). The average MSTS score at follow-up was 21.9. At follow-up, 64% of patients had a better or similar ambulatory status. Pain requirement decreased significantly post-operatively after treatment with the IlluminOss photodynamic bone stabilization system. All patients were able to weight-bear immediately post-operatively and most were able to improve or return to their original ambulatory status.

## Use of Modular Intercalary Endoprotheses are Associated with 80% MSTS Scores and at Highest Risk for Failure at the Femur

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Reconstruction after resection of diaphyseal tumors have been limited to megaprotheses that involve the joint. Intercalary endoprotheses allow for early return of function with a smaller sized implant. We sought to answer the following questions: What are the outcomes of patients treated with an intercalary endoprosthesis for diaphyseal segment defects? What complications does this patient cohort face? Medical records of patients treated with intercalary endoprotheses from 2008-2018 with segmental bone loss from an aggressive or malignant tumor with joint preservation were retrospectively reviewed. Information on stem characteristics, spacer size, complication type, and location were obtained. Functional status was determined via the Musculoskeletal Tumor Society score. Patients underwent cemented reconstruction with a modular intercalary endoprosthesis (OsteoBridge™ IDSF; Merete, Berlin, Germany) of the extremities. Thirty-six patients, 40 limbs, were included. The average age at time of surgery was 60 years with a mean follow-up of 37 months. Of the 40 endoprotheses, 27 limbs were treated for metastatic disease and 13 for primary tumors. Thirty-two patients underwent surgery for primary resection and eight had surgery as salvage after failed reconstruction. The average defect for humerus, femur, and tibia reconstruction were 6.3cm, 9.7cm, and 10.6cm. There were 10 (25%) complications categorized according to the Henderson failure modes classification. Functional analysis revealed an average MSTS score of 80%. Intercalary endoprosthetic reconstruction offers a limb-salvage solution for patients with diaphyseal tumors, with a complication rate of 25% and MSTS scores of 80%. Femoral reconstruction with this technique presents the highest complication rate in this series.

## Influence of Facility Type on Treatment Patterns for Patients with Primary Malignant and Soft Tissue Tumors with Metastatic Disease: A NCDB Analysis

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The management of primary malignant bone and soft tissue tumors with metastatic disease at presentation remains a complex challenge that may benefit from a large multidisciplinary surgical and medical team. We sought to answer the following questions: Does facility type alter survival outcomes and treatment in these patients? The 2004-2020 National Cancer Database (NCDB), a national registry, was analyzed to identify patients with primary malignant bone and soft tissue tumors with metastatic disease on presentation. Data obtained included demographics, tumor characteristics, and facility type. Multivariate Cox regression analyses were used. A total of 1,160 patients were reviewed. Of the patients that underwent chemotherapy alone, 152 were at academic institutions and 114 at non-academic institutions. Of those that received chemotherapy + surgery, 149 were at academic institutions and 75 at non-academic institutions. Patients treated with only chemotherapy were more commonly treated in non-academic facilities ( $p = 0.034$ ). There was no difference in overall survival across facility type (hazard ratio 1.046 [95% CI 0.733 – 1.093]  $p = 0.688$ ). Management of primary malignant bone and soft tissue tumors with metastatic disease at presentation is complex and deserves investigation into what factors result in the best overall survival outcomes. Further investigation is warranted to definitively state if the facility type is a factor in overall survival and to discern reasons for differences in treatment.

## Impact of Surgical Treatment on Survival in Patients with Metastatic Primary Bone and Soft Tissue Tumors: A NCDB Analysis

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The management of primary malignant bone and soft tissue tumors in patients with metastatic disease at presentation remains a complex challenge that may benefit from a large multidisciplinary surgical and medical team. We sought to answer: Does tumor resection improve survival outcomes in patients with metastatic disease in comparison to only stabilization with chemotherapy? The 2004-2020 National Cancer Database (NCDB), a national registry was analyzed to identify patients with primary malignant bone or soft tissue tumors. The study sample was divided into two groups: those who underwent surgical resection and chemotherapy and those who received chemotherapy alone. Data obtained included demographics, tumor characteristics, and additional treatment. Multivariate Cox regression analyses were used. A total of 1,160 patients with primary malignant bone or soft tissue tumors were included. After controlling for tumor type and patient demographics, surgical resection of the primary sarcoma + chemotherapy improved overall survival in patients with metastatic disease as compared to chemotherapy alone (hazard ratio 0.63;  $p < 0.001$ ). Distant metastasis to sites other than bone and lung were found to be associated with decreased overall survival (hazard ratio 1.966;  $p < 0.001$ ), along with a clinical tumor classification of 3-4 (hazard ratio 1.647;  $p < 0.011$ ). Surgical resection + chemotherapy of the primary site was associated with an increased overall survival in comparison to those who only received chemotherapy in those who presented with metastatic disease.

## A Definition Analysis Oligometastatic Disease in Soft Tissue Sarcomas: A Systematic Literature Review

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Oligometastatic disease in soft tissue sarcoma was first described in 1995 by Hellman and Weichselbaum. Oligometastatic disease occurs when cancer cells from the primary tumor travel through the body and form new tumors elsewhere. The number of new sites required to meet this definition regarding sarcomas has not been established. We sought to answer: Does reporting of oligometastatic disease in soft tissue sarcomas vary in literature? A thorough literature review was conducted using the PubMed and MEDLINE database through February 2024. Inclusion criteria were peer-reviewed studies which reported on oligometastatic disease in soft tissue sarcomas with a clear definition. Two independent reviewers screened the titles and abstracts, and full papers. Descriptive statistics were performed. Twenty studies were included. Out of twenty studies, eight defined oligometastatic disease as “a limited number ( $\leq 5$ ) of metastatic lesions at diagnosis or recurrence.” Five studies define it as “metastases that are limited in number and location and are amenable to regional treatment.” Four studies used the following “defined in presence of  $\leq 3$  concurrent metastatic sites with a controlled primary tumor.” The remaining studies define it as “organ-specific tropism, which occurs relatively early in metastatic dissemination” and “ $\geq 2$  metastatic sites”. A review of literature demonstrates a lack of consensus on what is reported as oligometastatic disease in soft tissue sarcoma. Out of 20 studies, 15 included a specific number of affected sites in their definitions. Developing a universal definition will inform treatment options and allow investigators to be better informed by the literature.



## Chondromyxoid fibroma of the hand

### About a case

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**Introduction :** Chondromyxoid fibroma is a rare benign bone tumor and even more so in the hand, since it represents less than 3% of different bone locations. It can pose differential diagnosis problems with several types of tumors and in particular with chondrosarcoma, the management of which is completely different. **Materials and methods :** 50-year-old patient who consults for painful swelling on the dorsal side of the left 4th finger that has been present for 8 months MRI: osteolytic tumor process, centered on the head of the 4th metacarpal with involvement of the metacarpophalangeal joint, without suspicious arterial vascular contact. The patient underwent a biopsy revealing a chondromyxoid fibroma, followed by a wide excision of the tumor. **Results :** The histological study confirms the diagnosis of a chondromyxoid fibroma. After 1 year, no recurrence. **Conclusion :** Chondromyxoid fibroma of the hand is a rare benign bone tumor, which particularly affects the metaphysis of long bones. It is made up of chondroid, myxoid and fibrous elements. Radiology reveals a benign-looking lytic, metaphyseal lesion. Its treatment remains surgical.

## Management of Malignant Bone tumours with ECRT

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### Introduction:

Bone tumors are a major health issue. Limb salvage surgery is an option to decrease such burden and also improve quality of life. Limb salvage surgery with reconstruction with autograft bone after extracorporeal radiotherapy (ECRT) is now becoming popular with good functional outcome and survival of patients. ECRT can be done in Solid bone tumor which is radiosensitive, solitary, has no metastasis and located in limb extremities.

### Methods:

Biopsy proven, No metastasis cases were chosen. Neoadjuvant Chemotherapy was given. Tumor containing bone segment removed - En-block and sent for Single high dose radiation (50 Grey). Now after radiation bone segment Re-implanted with parent bone with appropriate internal fixation, locking plates/nails.

Follow-up of 4 cases is shown.

### Conclusion:

Extracorporeal irradiation is a useful, convenient technique for limb salvage when there is reasonable residual bone stock. It is oncologically safe and has good functional results. A radiation dose of 50 Gy for sterilizing the bone ensures adequate tumor kill, while minimizing deleterious effects on biomechanical and biological properties of the bone.

The use of appropriate implants for adequate internal fixation and supplementary bone grafting at index surgery may help reduce the need for subsequent additional intervention to achieve a union.

## Innovative Technique of Chest Wall Reconstruction with Prolene Mesh After Forequarter Amputation with Chest Wall Resection

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**Introduction:** The incidence of malignant peripheral nerve sheath tumors in the general population is approximately 0.001%. MPNSTs of the brachial plexus are even rarer with an incidence that is not well defined and have only been recorded in previous case reports. These are aggressive soft tissue sarcomas with a high incidence of distant metastasis. There is no strict algorithm for treatment and involves a combination of resection with chemotherapy and radiotherapy. **Objective:** To document a case of MPNST of the brachial plexus with a multidisciplinary and novel approach to surgical treatment. **Method:** A 31-year-old female came in with a complaint of a growing mass on the right axilla. On PE, there was an 11cm x 4cm mass on the right anterior axillary area that was firm, tender, and nonmovable. There was limited ROM of the upper extremity with dysesthesia over the shoulder, elbow, wrist, middle and index fingers, and thumb. The patient underwent forequarter amputation with rush frozen section, resection of 1st and 2nd ribs, mesh placement, chest tube insertion, wedge resection of pulmonary nodule and advancement flaps with primary closure using the pectoralis major and trapezius. **Result:**

1 month post-operatively, there was good post-operative site healing with only minor complications and the patient was discharged. **Conclusion:** MPNSTs is a challenge for physicians and necessitates a multifaceted approach to care. The orthopaedic surgeon's goal is resection of tumor with attempts to preserve functional capacity. Cooperation with TCVS, Internal Medicine, and Plastics contributed to the success of the novel surgical approach.

## Management of recurrent fibrous dysplasia of proximal femur by internal fixation with combination of hydroxyapatite and allograft: a case report.

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**Introduction:** Fibrous dysplasia is regarded as bone development disorder in which normal bone is replaced by benign cellular fibrous connective tissue. Treatment is usually conservative by biphosphonate and pain control. Surgical management is technically demanding and reserved for cases presented with sever deformity, recalcitrant pain or impending fracture. **Case presentation:** This is a case report of 23 year-old male, presented with recurrent fibrous dysplasia of left proximal femur with sever shepherd's crook deformity, pain, nine cm shortening and history of previous open reduction and internal fixation with bone graft at the age of 10. Corrective osteotomy, internal fixation with plate and screws and bone graft was done. **Conclusion:** Even in cases with sever deformity, good clinical outcome can result from corrective osteotomy, internal fixation and bone graft. **Keywords:** Fibrous dysplasia, Allograft, Hydroxyapatite, Plate fixation, shepherd's crook deformity.

## Preventing complications during limb salvage following excision in a case of Osteogenic Sarcoma

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**Introduction:** Limb salvage has become the state of art in managing malignant bone tumours. We present retrospectively as to how we could prevent complications following limb salvage in a case of a mammoth Osteogenic Sarcoma. **Material and Method:** A young 14 year old male patient with a high grade extracompartmental osteogenic sarcoma without metastasis ( Enneking's Grade II B ) of the right proximal tibia was treated with excision and reconstruction. Initially the patient had a problem of soft tissue necrosis which was treated by a plastic cover. **Result:** This patient returned after 6 months with local soft tissue recurrence. **Conclusion:** This complication could be avoided by proper dissection, coverage of prosthesis with Gastrocnemius flap in the same sitting leading to timely wound healing which then would have avoided the flap necrosis and the need of a late flap so that timely adjuvant chemotherapy could be given. Patients after surgery tend to avoid follow-ups in the hope of cure following surgery and then lack of adjuvant chemotherapy brings about recurrence. Limb salvage surgeries can be avoided in late presenting, high grade malignant and Mammoth lesions of osteosarcoma.

## Medial discoid meniscus in a pediatric patient. Case report and review of the literature.

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**Introduction:** Discoid meniscus is a congenital morphological variant of the meniscus, which tends to occur more frequently in its lateral form than in the medial form. This anomaly is characterized by central hypertrophy of the meniscus and a larger diameter than the normal meniscus, resulting in an abnormal shape and greater coverage of the tibial plateau. The clinical presentation of this condition varies depending on the stability of the meniscus. In pediatric patients, in particular, it is common to experience progressive and atraumatic symptoms, such as pain and limited mobility. Diagnosis is based on imaging studies, with magnetic resonance imaging being the preferred tool, where the «bowtie sign» is a classic finding. Surgery is recommended for symptomatic patients, with a focus on preserving the peripheral portion of the meniscus. Saucerization is the most commonly used technique, followed by stability assessment to determine if additional procedures are required.

**Methods:** In this case, a 9-year-old patient with a medial discoid meniscus presented symptoms following trauma. **Discussion:** Despite this atypical presentation, a successful outcome was achieved through arthroscopic surgery, underscoring the importance of accurate diagnosis and proper management of this condition in pediatric patients. **Conclusion:** Understanding the anatomical and pathophysiological characteristics of the discoid meniscus is essential for an effective therapeutic approach.

## A rare cause of limited articular mobility of the knee - a clinical case presentation

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We present the clinical case of a 17-year-old female teenager, previously healthy, referred to the Pediatric Orthopedics consultation at our service due to marked limitation of joint mobility in her right knee. The x-ray demonstrated an apparently intra-articular bony mass, located anteriorly to the tibial spines. On physical examination, presented a flexion deformity of the right knee of about 45 degrees, with painful mechanical block of the knee extension. The MRI study confirmed the presence of a bony exostosis on the anterior aspect of the tibial plates, approximately 2.5 cm in size with an internal chondroid appearance, suggestive of an osteochondroma located intra-articularly. Arthroscopy was performed to excise the osteochondroma, located anteriorly to the insertion of the anterior cruciate ligament, and evaluate the intra-articular structures, with no other injuries identified. In the postoperative period, the patient began a rehabilitation program to recover joint range of motion. Currently, with approximately 8 months of evolution, shows a clear improvement in the joint mobility of her right knee, maintaining a limitation of the extension of approximately 10 degrees and the radiographic study without apparent recurrence of the osteochondroma. This case illustrates a rare presentation with an atypical location of an osteochondroma with functional and quality of life impairment.

## Limb salvage using bone transport technique for distal tibial osteosarcoma

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(Introduction) Osteosarcoma is the most common primary malignant bone tumor, and since it often occurs in teenagers, there are various problems about reconstruction after resection. Here, we would like to report a case in which bone transport (BT) was used for limb reconstruction after resection of tibial osteosarcoma. (Case) A 13-year-old boy visited a local doctor complaining of pain in his left lower leg. He was diagnosed with osteosarcoma of the tibia due to open biopsy. MAP therapy was started at our hospital, and wide resection and Ilizarov-type external fixator were installed for BT. The bone defect was 13 cm, and lengthening was started at 0.5 mm x 2 times/day one week after the surgery. Callus formation was good, but bone atrophy started to appear after postoperative chemotherapy was started, so the treatment was changed to 0.5 mm/day. We performed bone graft at the docking site and extension area due to poor bone formation. Afterwards, he had no problems with bone formation, but there was 3cm limb length discrepancy at 2 years after initial treatment. (Conclusion) In this case, the tumor extended to the distal epiphyseal line of the tibia, and considering the patient's age, no artificial joint replacement was performed. Although the bone transport would be required multiple surgeries over a long period of time, the patient is currently able to walk with full weight with no local recurrence. Although it is necessary to use various methods depending on the case, we believe that the BT is a useful method.



## Cosmetic Limb Lengthening Using External Hinges Salamehfix

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Purpose: cosmetic limb lengthening a fine work must done by experienced hands, lengthening with keeping bone alignment, minimal pain and discomfort request external hinge distraction system which allows stable fixation, smooth bone formation, regeneration, simultaneous correction of bone bowing for that, Salamehfix 1 external fixation Device designed. Method; 243 cosmetic limb lengthening cases was done since 2001, from 140 cm up to 170 cm, advantages; arc hinged system rather than ring system, comfortable, deferent size arcs, diameter and perimeter take the shape of the extremity, small, fit the extremity, supported with hinges at lengthening site, any combined angulation or mal alignment corrected during lengthening, possible lengthening and axis correction, pin fixation in deferent levels and angles, stable fixation, weight bearing, pins, wires don't pass muscles, less painful. used half pins not wires. Results: lengthening was from 5 cm to 13 cm, one case 16.5 cm, two surgeries at the same cut. Most of them did 7.5 cm. Complications were local infection mostly treated locally, one case deep infection needed curettage and pin replacement, mostly who did lengthening over 8 cm had ballerina foot and knee bended and needed percutaneous tendon Achill lengthening after lengthening period. In long term results all patients returned to previous physical activity. Conclusion: cosmetic limb lengthening is a fine work, and used System Salamehfix 1, have a multiple functions which allows stable fixation, early weight bearing, simultaneous lengthening and correction, small size and comfortable to patients in motion.

## The Role of Elastic Intramedullary Nailing in Challenging Limb Lengthening Cases: A Literature Review with Reference to Two Clinical Cases.

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External distraction osteogenesis is a method frequently used for the treatment of limb length discrepancies. This involves prolonged use of an external fixation device, with all the associated comorbidities. Pokpov and Lascombes have published works demonstrating the use of combined osteogenesis technique in the treatment of limb length discrepancies. This involves the use of distraction osteogenesis with external fixation along with the adjunctive use of elastic intramedullary nails. These principles can also be applied in cases of difficult-to-treat non-union. In this work, we also present two clinical cases where the use of intramedullary nailing played an important role in the treatment of non-unions.

The first case depicts a femoral non-union in a post-traumatic context, with multiple failures of osteosynthesis, where bone consolidation was achieved after intramedullary nailing. The second case describes the treatment of femoral hypoplasia where the use of elastic intramedullary nailing allowed consolidation of the non-union focus in the bone regenerated during guided growth treatment.

The use of guided growth technique with external fixation in the treatment of congenital limb length discrepancies or post-traumatic contexts is challenging, often resulting in serious complications for the child such as local infection or non-union. Although there is limited evidence on the subject, partly due to the relatively rare frequency of using this technique, the use of elastic intramedullary nailing in the context of combined osteogenesis may play an important role in challenging cases of guided growth/non-unions of long bones.

## Congenital Pseudoarthrosis of the tibia: distinctive management by tibialisation of fibula added with bone transportation technique

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**Introduction:** Congenital pseudoarthrosis tibia is one of the most challenging clinical entities as far as treatment is concerned. The primary considerations are resection of the non-viable tissue and bone grafting the defect by stable fixation and correction of angular deformity without leg length discrepancy. However, this may not be possible for cases with significant tibial bone loss. To overcome the shortcomings with the basic procedures we managed the defect by ipsilateral fibular transfer (TIBIALISATION OF FIBULA) followed by bone transportation to correct limb length discrepancy. **Material and method:** In this case, the pseudoarthrosis was associated with significant tibial bone loss without any proximal migration of intact distal fibula It was treated by excision of pseudoarthrosis followed by ipsilateral fibular transfer which is stabilized with k wire at 10 months of age. Later, the 17cm shortening was managed with limb lengthening procedures. **Discussion:** The management of pseudoarthrosis of the tibia remains one of the most difficult problems. Rober W H & Pho. have so far found more than forty operative techniques that have been described. A review of the literature discloses many methods advocated, Boyd & Saged report. 23 variations of operations in 167 procedures in 91 patients ranging from conservative measures to radical up to Amputation. **Conclusion:** A child with significant tibial bone loss with an intact distal third fibula can be managed by tibialisation of the fibula with better results in terms of union

## Humeral lengthening with a rail fixator

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**Introduction:** Humeral lengthening is an infrequent and demanding procedure that necessitates skills and meticulous surgical technique. As there are not many papers describing the technique into details, the void needs filling, so the next case presentation is dedicated to exactly this reason. **Method:** A 16 years old boy had the right humerus severely impacted growth by an iatrogenic epiphysiodesis, caused by titanium elastic nails. 2 years post the original accident and the subsequent surgical treatment the humerus had more than 7 cm shortening. Careful planning, including CT and 3D reconstruction was executed and when the bone model excluded the chance of using an electromechanic growing intramedullary device, an external fixation had to be planned. Under general anesthesia, the entry portals of the fixator pins were prepared, the pins inserted - two in proximal and 2 more into the distal fragment- and the fixator applied in closed position. Only then the osteotomy of the middle third of the humerus was executed.

Pins entry sites were dressed and 5 days after the osteotomy the lengthening was initiated in 4 daily increments of 0.25 mm each, for 10 weeks with a day off lengthening in the end of each week. X-ray controls every 3 weeks to confirm the progress were taken. Then for 3 months with the fixator in place, active physiotherapy, including strenuous exercises was started. 5.5 months after the osteotomy the fixator removed, with a gain of 7.5 cm and no neurological complication to note. Excellent technique with predictably good result.

## Effects of different pelvic osteotomy surgeries on acetabular center and pelvic morphology

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**Objective:**To compare the effects of Salter pelvic osteotomy, Pemberton pelvic osteotomy, and triple pelvic osteotomy on the center of acetabulum and pelvic morphology in children with hip joint disease.

**Methods:**The data of children treated with Salter pelvic osteotomy, Pemberton pelvic osteotomy, and triple pelvic osteotomy between January 2011 and December 2020 were collected. After discharge, the outpatient review was followed up for at least 1 year. All patients underwent anterior–posterior pelvic X-ray scanning before surgery, three months after surgery and every six months after the first year. The following X-ray features were analyzed: bilateral pelvic height, iliac crest inclination, a horizontal distance of the acetabulum center, and vertical distance of the acetabulum center.

**Results** The mean follow-up time was  $16.9 \pm 4.9$  months in the Salter group,  $20.7 \pm 5.1$  months in the Pemberton group, and  $18.0 \pm 5.4$  months in the triple group. No significant differences between PH, HD, and VD of both sides on the preoperative AP pelvic x-ray were found. However, at the last follow-up, PH, HD,VD, and ICI increased in the Salter group, PH and VD increased in the Pemberton group, and VD decreased in the Triple group.

**Conclusion** Salter pelvic osteotomy may cause pelvic height to increase and the center of acetabulum to move outward and downward. In contrast, Pemberton pelvic osteotomy may cause pelvic height to increase and the center of acetabulum to move downward. Triple pelvic osteotomy only causes the center of acetabulum to move downward.

## Current issues in the diagnostics of hip dysplasia in newborns in the regions of the Russian Federation

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Early diagnostics of hip dysplasia in newborns is important medical and social issue because delayed treatment leads to severe irreversible disorders of the hip joint, dysplastic osteoarthritis and disability. Late diagnosis of the dysplastic hip joint is not rare in patients with hip-related disability. To identify the causes of the late diagnosis of dysplastic hip joint in newborns in Russian Federation statistical data from 64 regions were collected and analyzed. According to the information received, 3,456,207 children were born in 64 regions of the Russian Federation between 2019 and 2021. Of these children, 108,737 (3.1%) were diagnosed with hip dysplasia of different severity (acetabular dysplasia, subluxation, and dislocation), and 3,943 cases (3.6%) had late diagnosis. Delayed presentation of the patients for ultrasound screening and clinical examination was the most common reason for the late diagnosis, with limited accessibility of diagnostic facilities as the second important reason. To reduce the number of cases with late diagnosed or neglected dysplastic hips and improve the quality of orthopedic care, focused information is recommended both among parents and non-orthopedic healthcare staff as well as better networking with orthopedic and ultrasound specialists.

## Epiphyseal fractures of the distal femur in children. A review of 22 cases

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Physeal fractures of the lower extremity of the femur in children are uncommon but serious. Those lesions could produce damage to the growth plate with angular deformities and leg-length discrepancies. The aim of our study is to evaluate the outcomes of physeal fractures of the lower extremity of the femur. We report a series of 22 physeal fractures of the lower extremity of the femur collected at the pediatric orthopedic surgery department. We respected a minimal follow up of 18 months. We used assessment criteria for the lower member according to the Eastern Orthopedic Trauma Society (SOTEST) to evaluate our results. Mean age was 12.2 years. Most of trauma was due to traffic accidents (73%). The physeal fracture was SH II in 15 cases (68%) followed by SH I in 3 cases (14%), SH IV in 3 cases (14%) and SH III in 1 case (5%). Surgical treatment was indicated in all our patients. It consisted of fracture reduction and percutaneous pinning in 15 patients (68%), fracture reduction and fixation with cancellous bone screws in 3 patients, combination of percutaneous pinning and cancellous bone screws in 3 patient and external fixator in 1 patient. We noted 3 cases of infection, 2 cases of recovery for poor reduction, 5 cases of epiphysiodesis and 2 cases of knee stiffness. Our results were very good in 54% of the cases, good in 14%. Poor results appeared to be favored by open fracture, Type VI of SH and high energy trauma.

## The management of Blount disease in children : about 10 cases

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The management of Blount's disease is a challenge for the pediatric surgeon, especially in advanced forms accompanied by depression of the medial tibial plateau. The aim of our study is to analyze our therapeutic management of Blount's disease and to propose at the end a practical approach in the light of international studies. We report a retrospective observational study concerning Blount's disease, collected in the pediatric traumatology and orthopedics department during the period from January 2009-January 2021. Our series included 10 children (13 knees), with a sex ratio of 2.33, the average age was 5.6 years, with a predominance of the young child age group. Knee deformity was the main reason for consultation found in 80% of cases. The involvement was unilateral in 60% of cases. The orthopedic treatment was performed in one child (7%). The surgical treatment concerned 9 patients, (12 knees), it consisted of closing wedge osteotomy in 6 patients (7 knees) and tibial osteotomy according to RAB in 4 patients (5 knees). After a mean follow-up of 14 months, the result was good in 7 cases (53.8%), fair in 2 cases (15.3%) and poor in 4 cases (30%), of cases. Four cases of major complications: 1 case of compartment syndrome, recurrence in 1 case, 1 case of pseudarthrosis and 1 case of early wound infection). Closing wedge osteotomy is a simple, safe and effective technique for acute correction of severe Blount's disease. Complications appeared to be higher in young children and with tibial osteotomy according to RAB



## Trapdoor procedure to treat of benign bone lesion involving the femoral head in skeletally immature children

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**Introduction:** Bone lesion involving the femoral head is a thorny issue for orthopedic surgeon, especially occurring in children. The aim of this study was to evaluate the effectiveness of trapdoor procedure to treat benign bone lesion in skeletally immature patients. **Methods:** Between 2013 and 2023, 6 patients for bone lesion of the femoral head were diagnosed in our institution. Except that one chose conservative observation, trapdoor procedure was performed in 5 patients. CT and MRI were performed to estimate the extent of the lesion before operation. All of 5 patients with surgical treatment were followed up for a mean of  $37.8 \pm 11.2$  months. Pathologic evidence, recurrence, and any complications were noted. McKay clinical grading method was used to assess functional outcomes. **Results:** Two patients were confirmed to have Langerhans cell histiocytosis (LCH), and two chondroblastoma on postoperative histology. One patient failed to provide a clear pathologic diagnosis, only indicating an increase in fibrous tissue cells. No recurrence was documented. Avascular necrosis (AVN) was noted in two patients. Both of them had revision operations subsequently. **Conclusion:** Trapdoor procedure is safe and effective technique for treating benign bone lesion involving the femoral head in children. AVN should be paid attention in skeletally immature patients.

## Wedgeless Distal Femoral Osteotomy for the Treatment of Genu Valgus Deformity

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**Introduction:** Coronal plane knee deformities are common disorders affecting adolescents. Valgus deformities (tibiofemoral angle (TFA) > 12-15 degrees and intermalleolar distance (IMD) > 10 cm) often require corrective osteotomy and a wedgeless "V" distal femoral osteotomy is a good treatment option for such deformities. **Materials and methods:** Thirty adolescent patients (13-17 years) with valgus deformities were included. Patients with severe collateral ligament instability, subluxation, and sagittal plane deformity > 15 degrees or genu valgum due to tibial deformity were excluded. Preoperative clinical and radiological evaluations were done. The surgery (wedgeless distal femoral V osteotomy) was performed and stabilized with two Kirschner wires (K-wires).

**Postoperative clinical and radiological parameters were recorded including complications. Results:** The preoperative TFA was  $20.23 \pm 3.63$  degrees, which reduced to  $5.5 \pm 0.73$  at six months postoperatively. The preoperative IMD was  $12.45 \pm 2.2$  cm, which reduced to  $1.63 \pm 0.32$  cm at six months. The mean mechanical axis deviation (MAD) and lateral distal femoral angle (LDFA) were recorded as  $2.8 \pm 0.39$  and  $87.7 \pm 0.83$ , respectively, and the differences were statistically significant from preoperative values. The Bostman score was  $26.2 \pm 1.79$  at three months and  $29.47 \pm 0.9$  at six months. The complications included infection in two patients, a hypertrophic scar in one patient, and common peroneal neuropraxia in one patient. **Conclusion:** Wedgeless distal femoral osteotomy with K-wire fixation is a viable option for correction of genu valgus deformity with potential advantages.

## Predictive Value of the Initial Degree of Abduction in Clubfoot Management

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**Introduction:** The prediction of number of casts in the Ponseti method has always remained a subject of interest. Previous studies on casting has been on the correlation of severity to the number of casts. No data exists as to how much correction is achieved with each Ponseti casting. To be able to predict the number of casting sessions would help immensely in the compliance and motivation of parents in developing countries such as the Philippines.

**Methods:** The study aimed to validate the degree of correction achieved with each Ponseti casting session. The study analysed records of enrolled cases at the International Clubfoot Registry managed at East Avenue Medical Center and Mabuhay-Deseret Foundation.

**Results:** An average of 9.4 degrees of abduction correction across all age groups has been achieved with each casting session. A decreasing trend in the magnitude of correction was observed among older age groups; average of 6 degrees in children 5 to years of age.

## Accelerated Ponseti method: Daily manipulation & Casting: medium to long term results

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Introduction: It is well known that Ponseti method became the gold standard for club foot treatment. During the last decade, there were some published studies about doing it twice or 3 times per week instead of once per week with a promising results.

Alaa Azmy from Palastine published a report of excellent short term results after daily manipulation and casting.

As in our university hospital, we face the problem of having patients coming from away cities with limited finance to bear the cost of transport weekly. So, we decided to admit them in the hospital and use the daily technique before doing the tenotomy and discharge them after a week to go back home.

Patients & Results:

75 feet in 51 babies were done since 2019 till now.

We had 22 feet in 15 babies ( 6 Female and 9 Male ) were followed up at least for 3 years.

19 feet had P = 0

While three feet had P = 0.5

Conclusion: After a three-year follow-up, our accelerated PONSETI method (daily manipulation and casting) found to be both safe and effective same as the weekly technique we used to do for our patients in our 20 years old Ponseti clinic in Cairo.

It is very valuable for the patients coming from remote area with no resources to come back and forth.

Simply:

It is Ponseti but faster outcome and impressive results as usual or better

## Single-stage correction of acute angle developmental coxa vara -surgical technique

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Neck shaft angle is less than normal in developmental coxa vara. This results in greater trochanter (GT) overriding which leads to Trendelenburg limping gait, limited hip abduction and limb length discrepancy (LLD) if unilateral. Bilateral affection causes waddling gait. Several techniques and fixation methods have been described for valgus osteotomy e.g.: Ilizarov external fixator, tension band wiring and plate fixation. Correction of sever degree of coxa vara is difficult and deficient publications is present about single-stage correction. The technique described in this article illustrates how to fully correct acute angle developmental coxa vara (neck shaft angle 30 degrees) to obtain better radiological and functional outcomes.

## Canadell technique combined with Capanna technique for treatment of femoral metaphyseal malignancy in a child

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Patient, male, 8 years old. On June 16, 2020, the boy was admitted to our department for the first time due to right thigh pain and lameness for 2 months. After admission, biopsy was performed. Postoperative pathology and immunohistochemical diagnosis showed osteosarcoma, and neoadjuvant chemotherapy was given. On 7 August 2020, epiphysis stretching (Canadell technique) was performed before resection of the osteosarcoma of the right femur, and the external fixator was extended by 1-2mm per day for 7 days. On August 14, 2020, resection of the tumor segment of the right femur, bone inactivation and replantation of the tumor segment, free fibula flap transplantation with vascular anastomoses, and internal fixation were performed. The patient received chemotherapy 3 times after surgery. Distal screw removal of the right femur plate epiphysis was performed on 30 March 2021 to avoid affecting the growth and development of the affected limb. After the operation, he could walk with partial weight. Canadell technology combined with Capanna technology provides a new effective treatment method for the clinical treatment of pediatric femoral metaphyseal malignancy. It can safely remove the boundary of the malignancy and save the limb at the same time, without affecting the growth and development of the affected limb, and can accelerate the healing of bone defect and early rehabilitation exercise.

## Management of Neglected Post-traumatic Posterior Hip Dislocation in a Three-year old Child-Case Report

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Traumatic hip dislocations in children are rare injuries and account for less than 5% of all paediatric dislocations. These are classified into anterior and posterior type. The minimal trauma can produce dislocation in younger children because of generalized joint laxity and the acetabulum being soft with pliable cartilage. It is not uncommon to miss the diagnosis of dislocations of hip in children especially the posterior dislocation.

There is no consensus about ideal approach for reduction in neglected hip posterior dislocation due to rarity of these cases.

In this case report, anterior hip approach was used to reduce a one-month neglected dislocated hip. After reduction, hip spica was applied for 6 weeks then removed and weight bearing was encouraged as tolerated.

After 3 years follow up, Patient had Grade II (good) result according to Modified McKay's criteria. X rays only showed non-progressive osteophyte at supracetabular area without avascular necrosis.

## Errors in Diagnosis and Initial Management of Recurrent Patellar Dislocation and the Application of BPT Graft in Extensor Mechanism Reconstruction

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**Introduction:** Recurrent patellar dislocations present a serious orthopedic challenge with potentially long-term complications. This case report explores the diagnostic and initial management errors in treating a female patient, along with the selection and implementation of a BPT graft in the reconstruction of the knee's extensor mechanism.

**Methodology:** The diagnostic procedures, initial management, and surgical approaches used in treating a female patient with recurrent patellar dislocation of the left knee are detailed. Methods, including CT and MRI scans, as well as operative techniques, are presented.

**Results:** The initial operation was unsuccessful, likely due to incomplete diagnostic evaluation and poor operative technique. Detailed analysis revealed significant anomalies, including insufficient fracture fixation and consequent lysis of the tibial tuberosity fragment. Following reconstruction of the extensor mechanism using a BPT graft, significantly better outcomes were achieved, including a full range of motion and absence of pain in daily activities.

**Conclusion:** This case report highlights the need for accurate diagnosis and strategic management in cases of recurrent patellar dislocations. It also underscores the effectiveness of the BPT graft in extensor mechanism reconstruction as a reliable alternative in complicated cases.

**Keywords:** recurrent patellar dislocation, BPT graft, extensor mechanism reconstruction, diagnostic errors, initial management.



## Neglected congenital patella dislocation- A single sitting 4-in-1 technique to restore the normal knee extensor mechanics

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Introduction: Congenital dislocation of patella (CDP) is a rare condition where patella is dislocated lateral to the trochlear groove. This condition is usually painless and often missed in the early years. Patients present late with complaints of abnormal mass around knee which arouse parental concern. A delayed presentation is associated with hypoplastic bony and lax soft tissue stabilizers of patella, which make the treatment challenging. Case report: We report a case of an 8-year-old child who presented with complaints of frequent falls on running. A careful clinical and radiological examination confirmed a long standing lateral dislocation of the right patella. Knee computed-tomography scans highlighted a dysplastic trochlear groove with a hypoplastic dislocated patella. Magnetic resonance imaging was necessary to picture the soft tissue stabilisers of the patella. A combined bony and soft tissue reconstruction - trochleoplasty, tibial tubercle medialization, lateral release with medial patello-femoral ligament plication and quadricepsplasty ( 4-in-1 procedure) was carried out in a single sitting. A rigorous post-operative rehabilitation protocol was initiated which yielded satisfactory results on a 2-year follow-up. Conclusion: A meticulous surgical correction involving both bony and soft tissue structures are required to restore normal patellar tracking in neglected CDP cases. This involves a careful scrutiny and planning of pre-operative imaging to tackle the dysplastic distal femur and lax soft tissue stabilizers of the patella. A single sitting correction with this 4-in-1 technique, which addresses all these components, is often essential to restore the normal knee extensor mechanics.

## Surgical treatment of Legg-Calvé-Perthes disease: experience over 25 years.

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The aim of this study was to review our experience with the operative management of Legg-Calvé-Perthes Disease (LCPD).

Methods: Retrospective observational study of patients with LCPD treated surgically between 2007 and 2021. Patient demographics, radiological characteristics and treatment were recorded.

Results: 31 patients (21 male and 10 female), 7 with bilateral involvement, were included. Average age at presentation was 5,71 years (SD 2,45). 30 hips (64% Herring B and 36% Herring C) underwent varus osteotomy (VO) with an angulation between 20°-30°. The plate was removed in all patients after a mean of 25,93 months (SD 31,09). 75% of patients who underwent VO suffered lower limb dysmetria (mean 1,44 cm; SD 0,72), 52,38% were tributary of compensatory rises and 2 cases underwent a surgical physeal arrest. 3 valgus femoral osteotomy where performed in patients who had previously undergone VO. 2 pelvic osteotomies were performed. Only one patient underwent arthrodiastasis. Greater trochanteric epiphysiodesis was performed in 9 hips (23,68%) and adductor tenotomy in 6 (15,79%). Only 6 patients (19.35%), all of whom underwent VO surgery, required post-discharge follow-up due to coxalgia. Two of them underwent total hip arthroplasty 12 and 17 years after diagnosis, showing an association between Stulberg classification and the need for future arthroplasty ( $p=0.032$ ).

Conclusions: Varus osteotomy was the most used surgical technique, which has the disadvantages of requiring the removal of osteosynthesis implant and the lower limb dysmetria. Short-term and mid-term clinical outcomes are favorable, although the possibility of developing premature coxarthrosis remains.

## How to avoid failure in telescoping nail application in osteogenesis imperfecta -Technical guide to beginners.

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Osteogenesis imperfecta is characterized by brittle bones, frequent fractures, and skeletal deformities especially in lower limbs. Telescoping nail application is the gold standard intramedullary device that provides internal support and decreases reoperation rate as in ordinary rods.

Bisphosphonate administration improves bone quality and decreases fracture rate. Preoperative planning by full length long film x ray with Ap & Lat. Views detects site of the deformity and needed osteotomy. Coxa vara deformity- if not properly managed-leads to dislodgment of the nail from Greater trochanter and metal failure. To avoid that, subtrochanteric valgus osteotomy is done, reaming through lateral cortex of proximal fragment and augmentation of fixation by 2-3 k wires crossing femoral head physis and bent besides femoral shaft. Finally, cerclage is wrapped around the the wires and shaft. Comprehensive medical treatment, surgery, and postoperative rehabilitation is necessary to obtain a better outcome.

## Relapses in Idiopathic Clubfoot after Ponseti Method

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**Introduction:** Relapse is the most challenge aspect of clubfoot treatment because the biological forces act to restore the initial deformity. The purpose of this study was analyzing the relapse rate after Ponseti casts and results of its treatment. **Methods:** A retrospective study was performed reviewing the medical records of patients with idiopathic clubfoot from a Reference clinic. These patients were treated with Ponseti Method by the same professional and followed up for at least 4 years. The occurrence of relapses was analyzed, as well as the methods of treatment and their results. **Results:** A total of 649 feet with idiopathic clubfoot was treated, however just 395 feet were included because they had been followed up by the same professional for at least 4 years. Of these, 115 feet relapse from 106 patients, ratio of 29.4%. The predominance was male (56.9%). The average age at the beginning of treatment was 28 days (min 0 – max 4.5 years). An average initial Pirani score of 5.76 (0.5 - 6), 4.30 casts in initial treatment (2 - 8) were needed for correction. Tenotomy was performed in 99.1%. Most relapses were treated with a combination of new casts, tenotomy and anterior tibial transfer (73.8%). The result was that none of the feet undergone posteromedial release. Overall, 89.7% had no deformities and more than 10° of dorsiflexion in final follow-up. **Conclusion:** The average recurrence rate is consistent with the literature and its treatment with a return to casts and less invasive surgical procedures is effective.

## Outcome of different postoperative rehabilitation protocols following pediatric tibial tuberosity fracture fixation

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**Introduction :** Tibial Tubercle Fractures occur in adolescent boys near the end of skeletal growth(12-15 years age) .Based on fracture pattern , it require open reduction internal fixation .Different post operative rehab regimes have been used ranging from casting , brace (static or dynamic) for different durations .**Objective :** Our aim was to review functional outcome of post operative immobilization duration between 2 groups ( group A: 4weeks and group B: more than 4 weeks) . **Method:** retrospective study of 24 patients ( 20 male , 4 females )at RHC Glasgow, all patients were fixed with 4mm cannulated screws .Patients were reviewed at 3 and 6 months to fill questionnaire and duration of immobilization reviewed in retrospect .Mean age 13.5years .Outcome was measured with KOOS-Child which covers 5 dimensions (subscales): Pain, Symptoms (titled “Knee problems” in the KOOS-Child), Difficulty during daily activities (ADL), Function in sport and play (Sports/Play) and knee-related Quality of Life (QOL) at 3 and 6 month duration. Higher score indicate better function .**Result:** 22 patients maintained follow up .Although KOOS score of group A&B were different at 3 months but there is no significant average score difference at 6 months (pain: 84 versus 83 , symptom: 85 versus 85, ADL: 86 versus 87 , sport: 65 versus 68 , QOL: 71 versus 73 versus) .**Conclusion :** we support short term immobilization post tibial tuberosity fixation .

## Congenital Knee Dislocation – Our Experience of 12 knees with a minimum 5 years follow-up

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**INTRODUCTION** - Bilateral congenital knee dislocation (CDK) is a rare deformity. In the early period, conservative treatment options have a high chance of success. Aim is to retrospectively evaluate minimum 5 year functional outcome in CDK Patients after treatment. **METHODS** - All cases were retrospectively collected from institutional service register. Study duration was from December 2010 to January 2024. 12 knees in 11 patients (8 females and 3 males) were included. All cases with only knee involvement and those presenting within 1 month of birth were included. All complex cases with multiple joints involved or with syndrome and those presenting late were excluded. We broadly classified knees on the basis of range of motion: Group 1 – Full flexion possible (>90 degree); Group 2 – Flexion more than 30 but not complete (<90 degree); Group 3 – Stiff knee with flexion less than 30 degrees. Treatment was done as: Group 1 – serial cast application; Group 2 – needed percutaneous needle tenotomy; Group 3 – required quadricepsplasty. **RESULTS** - Mean degree of preoperative hyperextension was 70 degrees. Mean flexion was 76.67 degree. Mean follow up was around 4.7 years. Mean knee flexion at end of treatment was 130 degree. Outcome was good in 11 knees and fair in one patient who underwent quadricepsplasty. **CONCLUSION** - No difference in final outcome was noted between conservatively treated and percutaneous tenotomy cases. But compromised outcome was seen in case with preoperative stiff knee with flexion less than 30 degree.

## Surgical techniques and Clinical outcome of Slipped upper femoral epiphysis (SUFE) in the Douala General Hospital

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**Introduction:** Slipped upper femoral epiphysis (SUFE) is a relatively common condition affecting the physis of the proximal femur. It is most common among male adolescents who are overweight. About a third of the cases are bilateral. In our context, most cases present late with marked displacement and severe hip pain making treatment challenging with seldom good outcomes. We report the treatment challenges and clinical outcomes of sufe treated at the Douala General Hospital

**Methods:** This was a retrospective study of files of patients who presented with sufe and were treated at the Douala General Hospital from January 2019 to December 2023. History, clinical aspects, treatment options, and follow-up reviews were extracted from hospital records to a data entry form. Data was analyzed using spss version 24 for Windows.

**Results:** A total of 15 adolescents were treated during the study period. There were 8 males and 7 females. The ages ranged from 7 to 15 years. All the cases were treated surgically. Ten patients had single screw fixation, 3 had double screw fixation, 1 had screw and pin fixation and 1 had double pinning. Radiographs were obtained during regular post-operative clinical evaluations. The mean follow-up time was 6 months ranging from 3 to 36 months. The mean Iowa hip score was 85.78. 8 were considered to have an excellent score, 3 were good 2 had fair results and 2 had poor results.

**Conclusion:** Slipped upper femoral epiphysis is common in our context. Early diagnosis and management are key to a good outcome.

## Compartment syndrome after a viper bite children :about 72 cases

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Compartment syndrome is a serious complication after viper bite, the similarity between the clinical signs of envenomation and those of the compartment syndrome poses a diagnostic problem. The aim of our study is to detail the epidemiological elements of viper bites in children, to detail their management and to create a profile of patients at risk of developing compartment syndrome. We conducted a retrospective study over a period of 11 years from January 1, 2009 to December 31, 2020. The severity of envenomation was assessed according to the Audebert classification. 72 children were included in our study, 52 of whom were boys. The median admission was 10 hours. 68% of the bites in our series were at the lower limb. 51% of patient were a grade II. 36% of the children in our series developed compartment syndrome. 52% of upper limb bites developed this complication compared to 28% of lower limb bites. 73% of patients with a Grade III, 38% of patients with a Grade II and 5% of patients with a Grade I developed a compartment syndrome. The specific treatment based on antivenom is the treatment of choice after viper bites. High-grade bites at admission and those at the upper limb level are at higher risk of developing compartment syndrome.



## A Case Study of Septic Arthritis Presenting as Hip and Elbow Pain in a Pediatric Patient

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Septic arthritis is a rare condition in the pediatric population, with an estimated annual incidence of 4 to 10 cases per 100,000 children, 50% occurring in children younger than 2 years old. Hip and knee joint account for 70% of septic arthritis.

Diagnosing septic arthritis in pediatric patients can be challenging, as symptoms may mimic other musculoskeletal conditions or present atypically. Clinical suspicion is paramount, particularly in cases of unexplained joint pain, fever, or limited range of motion.

A 7-year-old boy who experienced a minor hip trauma, initially was treated as a hip concussion. Four days after initial trauma, at the third visit to our ER he complained of increased hip pain, with claudication and minor elbow pain with limited range of motion.

An ultrasound documented hip and elbow effusion; he was febrile with a CRP of 30.22 mg/dL.

Diagnosis of hip septic arthritis was assumed, and surgical treatment was performed.

Therefore, patient underwent open drainage and debridement through an anterior hip approach.

Due to minor elbow complains, the surgical team performed an arthrocentesis drainage.

At 8th day due to poor clinical response a new open drainage of elbow was performed.

At 2nd day after re-intervention, for the first-time patient was afebrile.

This case underscores the importance of recognizing the potential for septic arthritis in children presenting with joint pain, even in the absence of signs of infection. A high suspicion is needed to exclude this differential diagnosis since prompt intervention is imperative in managing septic arthritis to prevent irreversible joint damage.

## Attempts to reduce nerve root transection rates in selective dorsal rhizotomy

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Spasticity in children with cerebral palsy (CP) is a motor disorder that interferes with mobility and affects the quality of life. Different approaches have been utilized to address patients. We performed selective dorsal rhizotomy (SDR) for spastic CP patients whose GMFCS level were I to V from 2017 to 2024 at our institute. Our SDR were performed with Physiotherapist (PT). PT checked patient's leg during operation in order to palpate and observe the patient's muscle contractions of the lower extremities during the rootlets electro-stimulation. This increases the reliability of testing and helps in judging the congruity of the results and also reaching the best decision on how many rootlets have to be cut. We included 10 CP patients (GMFCS I:2 II:3, III:2, IV:2, V:1 ) who received SDR. The ages at the time of the surgery were 3 to 6 years old. We evaluated nerve cut rates, level of root that were target of treatment, the functional result and complication.

## Kyphosis Correction: Robotic-Assisted Posterior Vertebral Column Resection.

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**Introduction:** Congenital kyphosis poses a challenge due to intricate 3D anatomy and the proximity of vertebral osteotomy to the spinal cord. Third-generation robotic systems ensure not only the accuracy of pedicle screw placement but also provide visualization during vertebral osteotomies.

**Methods:** A 12-year-old boy with progressively worsening spinal deformity since birth underwent assessment. Despite achieving age-appropriate milestones, he presented with acute kyphotic deformity at the thoracolumbar junction, featuring T11-T12 posterior hemivertebrae. The patient underwent robotic-assisted T8 to L3 posterior spinal instrumentation and fusion, incorporating navigated T11-T12 vertebral column resection with reconstruction using an expandable cage. Dual O-arm scans were utilized, with the first aiding in screw trajectory planning, and the second, post-T11-T12 laminectomy, guiding burr navigation during vertebral column resection. The patient was mobilized on the second postoperative day. **Results:** The procedure successfully corrected the kyphosis, and the patient experienced no neurocutaneous markers or signs of occult spinal dysraphism. Robotic assistance ensured accurate drilling trajectories, reducing the risk of pedicle breach. Navigable burrs facilitated safe execution of 3-column vertebral column osteotomies.

**Conclusion:** Robotic-assisted spine deformity correction minimizes pedicle breach risks and enhances accuracy in trajectory drilling. The navigable burr further allows for the safe execution of 3-column vertebral column osteotomies.

## Chronic Osteomyelitis in Children treated by Ilizarov

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Introduction: Chronic osteomyelitis in children is very difficult to eradicate completely. The patient with chronic osteomyelitis has a new hope of cure by recent advances in the management of chronic osteomyelitis. Systemic manifestations may subside, but one or more foci in the bone may contain purulent material, infected granulation tissue or a sequestrum. Materials & Methods: Duration: 1990 to 2023, Number of Children: 265, Age range: 3-15 years, Follow-up period: 2-19 years. Preoperative planning and assessment are very important in treating chronic osteomyelitis in children. 1. We must palpate arteria dorsalis pedis and posterior tibial artery. 2. Temperature and color of the foot must be seen. 3. We must assess with preoperative pulse- Occimeter. If the Ilizarov fixator is stable then the Corticotomy is performed at the proximal metaphyseal or distal metaphyseal region. To eliminate infection vascularization of the osteomyelitic centre is increased by the biological stimulation of corticotomy. The gap is closed by gradual controlled coordinated stretching by transporting the segment. 1mm per day till the distal end locks the proximal end of the distal fragment. Then the two fragments are compressed together. If the gap is too large, we should introduce a guide wire in between the fragments to keep the bone in anatomical position and to prevent any kind of angulation and rotation which can cause malunion and deformity of the limb. Results: Chronic osteomyelitis in children with pandiaphyseal osteomyelitis with pathological fracture, including discharging sinus can be treated by stable fixation of Ilizarov apparatus.

## How Parents Adapt with Child's Congenital Malformations and Deformations of the Musculoskeletal System in Taiwan: A Qualitative Study.

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Children with congenital malformations and musculoskeletal system abnormalities (e.g., DDH, polydactyly, achondroplasia, VACTERL association, etc.) often require repeated surgeries and experience various physical sequelae. Both affected children and families will face challenges like repeated treatments, enduring symptoms, and physical or psychosocial developmental delays. The mental health status and adaptability of key caregivers, such as parents, are crucial when navigating medical procedures or making decisions, significantly influencing the child's prognosis and their quality of life. This study aims to explore parents' experiences, challenges, mental health status, and coping strategies. Research data were collected through one-on-one interviews with parents of affected children, and data analysis utilized grounded theory techniques, including coding, theoretical sampling, and constant comparison. Analysis of individual interviews with 7 affected individuals and 10 parents resulted in an explanatory theory consisting of four categories: (a) neuropsychological functions that enable individuals to adapt; (b) how the support system made a difference; (c) the pros and cons of Taiwan's social culture and values; (d) the impact of medical treatment. The result shows there are many dilemmas caused by the medical system, the situation of the children, the situation perceived by the parents, and their multiple social roles at the same time. If the key person could activate and show their own strengths to help themselves respond and realize the support that can be sought and obtained, they could show a positive attitude, actions in stressful situations, and promote their own mental health, contributing to the child's disease prognosis and quality of life.

## A paradoxical association between osteopetrosis and rickets – a rare case report

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**Introduction:** Osteopetrosis is a rare autosomal recessive disorder, characterized by the failure of osteoclasts to resorb bone leading to impairment of bone remodeling. This results in skeletal fragility despite increased bone mass. Despite high positive total body calcium balance, rickets arise when the serum calcium-phosphorus product is insufficient to mineralize newly formed Chondroid and Osteoid. When both these conditions are seen in the same patient, it is called 'Osteopetrorickets', a paradoxical association. **Case report:** A 2-year-5-month-old female child presented with h/o inability to walk and bear weight and recurrent respiratory tract infections. The child was anaemic, with prominent ricketic features. On systemic examination, the patient had hepatosplenomegaly. Laboratory investigations showed anaemia, thrombocytopenia, hypocalcemia, hypophosphatemia, decreased Vit D3, and elevated serum PTH & serum ALP. The skeletal survey revealed features of rickets. Fundus examination showed B/L optic atrophy. Otological examination of BERA showed B/L sensorineural hearing loss. CT scan of long bones showed diffuse cortical sclerosis of all long bones. **Discussion:** Malignant infantile osteopetrorickets is a rare paradoxical association. The diagnosis of the condition is by regular biochemical and radiological investigations. Here the patient showed improvement with supplemental calcium, calcitriol, and blood transfusion. A definitive treatment is HLA-identical bone marrow transplantation. Death usually occurs in early childhood due to bleeding, anemia, and infections. **Conclusion:** Early diagnosis and treatment should be instituted for patients with a high index of suspicion with rickets features and prompt genetic counseling has to be done regarding the nature of the inheritance pattern of diseases.

## Needle arthroscopy in the surgical management of septic arthritis of the shoulder joint in a neonate and infant

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Septic arthritis in neonates and infants is a life-threatening condition which should be treated promptly to reduce morbidity and mortality. The chondrolytic effect of bacteria and proteolytic enzymes is well documented. Surgical management consists of repeated needle aspirations, arthroscopy or arthrotomy. In very small children, performing arthroscopy using conventional endoscopes is challenging. Arthrotomies carry risks, including iatrogenic injury to the key structures, given the small size of patients. It can also leave unsightly scars, and the approach to the joint can be challenging. We present two cases of native shoulder septic arthritis in paediatric orthopaedic patients under the age of two years managed successfully using needle arthroscopy. This technique involves a 1.9mm Arthrex 'NanoNeedle Scope' (Naples, FL, USA) in a 2.3mm sheath. A second portal can be used for joint sampling and irrigation outflow. Both children recovered with no repeated washouts necessary and excellent clinical results at an average follow-up of one year.

## Targeted epiphysiodesis using needle arthroscopy: a paradigm shift

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Epiphysiodesis is performed to either temporarily or permanently close the physis. It is considered in the management of angular deformities or limb length discrepancies. Various surgical techniques have been described; the gold standard remains the mechanical removal of the physis using drills, burrs, and curettes. This requires intraoperative imaging to guide surgery and invariably leads to the mechanical removal of healthy cancellous bones as well as physal cartilage. We report on a case of 'targeted epiphysiodesis' using needle arthroscopy. In this technique, radiation exposure and unnecessary bone loss is minimal. Epiphysiodesis is achieved under direct vision using a 1.9mm needle arthroscope with a successful outcome, and no surgical complications noted.



## Needle arthroscopy in the surgical management of Brodie's abscess of the distal tibia in an infant

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Brodie's abscess is a form of subacute osteomyelitis typically localised to the proximal and distal metaphyseal regions of long bones, with the lower limb, particularly the tibia, most often afflicted. Treatment typically comprises evacuation and curettage of the abscess cavity, often in conjunction with a course of antibiotics. The traditional surgical approach entails arthrotomy, with or without primary skin closure, facilitating abscess drainage. However, in the paediatric population, this exposure present drawbacks pertaining to both the potential for iatrogenic injury to adjacent neurovascular structures, given the small size of the patients, and aesthetic implications from scarring. Needle arthroscopy is emerging as a viable alternative to conventional arthroscopy, offering minimally invasive access to joints for diagnostic and therapeutic interventions using small instruments ("Nano-instruments"). We describe the novel use of this technology to treat Brodie's abscess in the left distal tibia of a 16-month-old male. The Arthrex (Naples, FL, USA) NanoNeedle Scope (NanoScope) and associated Nano-instruments were used, featuring chip-on-tip camera technology incorporated on a 1.9mm diameter shaft, introduced through a 2.3mm sheath. At the 6-week review, the patient exhibited no residual symptoms, demonstrating full range of motion, no pain, and healed skin at the incision points. To our knowledge, this is the first reported instance of needle arthroscopy being used for the evacuation and curettage of Brodie's abscess.

## Comparison of midterm efficacy of Kirschner wires and elastic intramedullary nails after closed reduction of Judet type 3 radial neck fractures in children: a multicenter study

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**Objective:** The objective of this study was to compare the midterm efficacy of Kirschner wires and elastic intramedullary nails after the closed reduction treatment of Judet 3 radial neck fractures in children.

**Methods:** This was a retrospective multicenter study of patients diagnosed with Judet type 3 radial neck fractures who underwent closed reduction and internal fixation at four tertiary hospitals from January 2019 to December 2021. Gender, age, fracture type, operation time, follow-up time, x-ray results and complications were collected. The recovery of elbow joint between the two internal fixation methods, elbow motion and complications at the last followup were compared.

**Results:** The average operation time of EIN group was statistical significantly increased compared with KW group. There were no significant differences in MEPS score and ROM 3 months after surgery between the two groups, but the ROR Angle of EIN group was statistical significantly increased compared with KW group 3 months after surgery. There were no significant differences in MEPS score, ROM and ROR at the last follow-up. The incidence of complications in EIN group was significantly lower than that in KW group.

**Conclusion:** The use of elastic intramedullary nails fixation or Kirschner wires fixation in the treatment of radial neck fractures in children can both achieve satisfactory fracture reduction and healing. Compared with elastic intramedullary nails, the operation time of Kirschner wires fixation is shorter, and the internal fixation does not need to be removed under anesthesia again, but the complication rate is higher.

## Madelung's Deformity: Prophylactic Bilateral Section Of The Vickers Ligament

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**Background:** Madelung's deformity is a congenital dyschondrosis of the growth cartilage of the distal radius that mainly occurs in female adolescents, often asymptomatic until skeletal maturity. It leads to partial deficiency of physal growth, resulting in radial deviation, volar inclination and ulnocarpal impaction. Although controversial, prophylactic release of the Vickers ligament has been described. **Case Presentation:** We introduce a 7-year-old female patient followed in the outpatient clinic due to positive family history of Madelung's deformity (mother and sister). Despite not presenting any symptoms or clinical signs, she underwent prophylactic bilateral Vickers ligament section and distal radioulnar joint release. **Clinical Outcomes:** Six months after surgery, full range of painless motion was achieved. The radiographs showed bilateral remodeling of the ulnar aspect of the distal radial epiphysis. The following evolution of radiological angles measured on the right and left, respectively, was observed after a 3-year follow-up period: 23° and 24° of radial inclination, 2° and 0° of volar tilt, preoperatively; 27° and 40° of radial inclination, 2 and 0° of volar tilt. The ulnar variance always remained negative. **Discussion:** Vickers and Nielsen suggested the prophylactic release of the Vickers ligament in skeletal immature children with family history of Madelung's disease. Even though the outcomes obtained in this single clinical case were good, the literature regarding the medium and long-term results of this prophylactic procedure is still scarce. In conclusion, sectioning of the Vickers ligament is a valid surgical solution for the treatment and prophylaxis of Madelung's deformity in the skeletally immature individuals.

## Surgical Diaphyseal Forearm Fractures In Children. Our Experience Over 16 Years

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Diaphyseal fractures of the forearm account for 6-10% of all fractures in children. Up to 3-4% of them are unstable after reduction, necessitating surgical treatment.

A retrospective case series of patients under 16 years of age with diaphyseal forearm fractures treated surgically in our department from March 2007 to March 2023 was carried out. Different variables of interest are collected, in order to carry out a comparative analysis.

We obtained 96 patients, with a mean age of 9 years (3-14). Surgical intervention was performed on the same day of emergency care in 40.8% of cases; the rest were performed on a scheduled basis in the first week. Surgical treatment was sufficient with closed reduction in most cases (78.2%) and KW fixation in 89.6% of the total. Post IQ admission time was a median of 1 day, KW and splint removal at 6 weeks, with subsequent brace protection in 23.4% of cases.

There were 6 cases of refractures (6.25%), and the mean follow-up time was 1 year. In a comparative analysis, we observed that age was related to a higher frequency of open reductions and, a higher frequency of plate synthesis at an older age, as well as a risk of refracture at a younger age.

In children with surgically treated diaphyseal forearm fractures, we found statistically significant differences when relating different variables, such as age, type of reduction, type of synthesis, posterior brace protection or refractures.

These results provide us with conclusions relevant to daily clinical practice.

## Management of trigger finger in children

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Trigger finger is a benign and rare condition that mainly affects the thumb. It is characterized by an idiopathic blockage at the Metacarpo-phalangeal joint, leading to pain and impaired finger function. Additional tests are often unnecessary. The surgical treatment of trigger finger in children involves releasing the A1 pulley, a procedure that can be performed using various techniques, including endoscopic, open, and percutaneous approaches. The retrospective series reported 30 cases of trigger finger at the Pediatric Orthopedics and Traumatology Department at CHU Mohamed VI in Marrakech over nine years, from January 2014 to March 2022. The study included 29 female patients (58.62%) with an average age of two years and nine months. In 23 cases (76.66%), the right side was affected. Among the children, the thumb was affected in 25 cases, the middle finger in 2 cases, and the ring finger in 1 case. In all the patients, trigger finger was primary. They were all operated on due to typical symptoms, involving the opening of the A1 pulley using an open technique. This procedure was successful in 28 patients (96.66%). After a follow-up of 12 months, the blockage had disappeared without recurrence in 28 patients. One patient experienced a recurrence that required reintervention. The condition of trigger finger is a rare and benign pathology. The treatment involves releasing the A1 pulley, but unfortunately, it is often overlooked by many doctors, leading to significant delays in diagnosis and consequently delayed appropriate treatment for the patient

## Pediatric Transphyseal Separation Versus Lateral Condyle Humerus Fracture. A Case Report, Diagnostic Dilemma And Approach To Treatment.

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The most common injuries around the elbow are the supracondylar humerus, followed by lateral condyle fractures. Transphyseal separation of humerus are uncommon in children older than three-years. Type 3 weiss lateral condyle fractures appear similar to transphyseal separation on standard radiographs but have articular incongruity and need open reduction. In comparison, transphyseal separations often need only closed reduction. We present a case of transphyseal separation of distal humerus in a four-year-old child treated with closed reduction and lateral pinning. With the help of the case, we describe the radiocapitellar, capitulo-lateral column, and ulno-humeral alignments on radiographs and arthrogram features in different injuries. The continuous articular margin on the arthrogram suggests transphyseal separations, type 1 or 2 Weiss lateral condyle fractures. Articular incongruency of dye can occur in non-reduced type 3 Weiss lateral fractures, which need open reduction and pinning. Transphyseal separations can be treated similarly to supracondylar fractures with two to three lateral or cross wires. For lateral condyle fractures, a pin in the transverse column gives additional stability in addition to the two lateral pins. Thus, proper pre-operative radiographs and intraoperative arthrogram can avoid unnecessary open reduction and complications. We also present a flowchart to help make a better decision regarding management. A careful assessment of alignments on radiographs and intraoperative arthrogram findings can help distinguish type 3 Weiss lateral condyle fracture from transphyseal separations. It can avoid unnecessary open reduction and its related complications.

## Fracture of Distal End Clavicle in Pediatrics – Conservative Treatment

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### Background:

Clavicle fractures are common pediatric injuries, however, they are rare in the distal region of the clavicle. Conservative treatment with a sling remains more commonly indicated at this age, due to the reported positive outcomes concerning consolidation and remodelling. Surgical management should be based on the patient's age and displacement, it's indicated for open fractures or those associated with soft tissue compromise.

### Case Presentation:

A healthy 7- year-old male presented to the pediatric emergency department with a closed left clavicle fracture after falling from his own height with direct shoulder trauma. Clinically shoulder pain and functional disability, without neurovascular compromise or wounds. Conventional radiography revealed a large split in the periosteal tube with superior displacement of clavicle. The patient was treated non-operatively with a sling.

### Clinical Outcomes:

At 2 weeks post-injury the patient denied any complaints or functional limitations, although visible deformity. Follow-up radiographs showed an evolving callus, with progressive remodeling and correction of the deformity without complications or limitations.

### Discussion:

Fractures of distal end clavicle are rare in immature skeleton, and are traditionally metaphyseal or physeal fractures and mimic acromioclavicular separation. As opposed to adults, this type of fracture usually retains the integrity of the coracoclavicular ligament, so conservative treatment is the standard. Although children have abundant osteogenic capabilities, adolescents nearing skeletal maturity may lack adequate remaining growth for sufficient remodeling. The type of treatment and surgical method are debatable in these cases.

## Correction of Forearm and Wrist Deformities in Hereditary Multiple Exostoses (HME) Using the Ilizarov Method

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**Introduction:** Hereditary Multiple Exostoses (HME) is a rare genetic disorder characterized by the development of multiple benign bone tumors, leading to skeletal deformities that often affect the forearm and wrist. The Ilizarov method, a versatile external fixation technique, has shown promise in correcting such deformities by providing stable fixation, gradual correction, and preservation of soft tissue integrity. This review aims to provide an overview of the application of the Ilizarov method in correcting forearm and wrist deformities in HME patients, including indications, surgical techniques, outcomes, and complications. **Materials & Methods:** Since 2000 to 2023, 35 patients were treated (22 males, 13 females) with Ilizarov apparatus in HME. The mean age of patients was 26 (range 11-35 yrs.). Patient charts and radiographs at three different time points (preoperative, peroperative, post-operative, fixator removal, and final follow-up) were reviewed. **Results:** Satisfactory in all 35 patients. **Conclusion:** The Ilizarov method represents a valuable option for correcting forearm and wrist deformities in HME patients, offering the advantages of stable fixation, gradual correction, and preservation of soft tissues. **Keywords:** Hereditary Multiple Exostoses, Ilizarov method, forearm deformities, wrist deformities, external fixation, distraction osteogenesis.



## Surgical treatment strategies in pediatric humeral supracondylar fractures: results from a retrospective clinical study

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**Introduction:** This retrospective study reports our experience in the surgical management of supracondylar fractures of the humerus, to identify the best surgical approach.

**Method:** Inclusion criteria: age <13 years with non-complicated Gartland type II-IV fracture without congenital and/or genetic, infectious, neuromuscular and underlying vascular diseases, that had a surgical treatment between January 2018 and December 2021. Clinical evaluation was performed before surgery, after surgery and at 3-months follow-up, using the Mayo Elbow Performance Index score (MEPI), Flynn's criteria, carrying angle and Baumann angle were assessed. **Results:** 146 children (male: 94; female: 52) with an average age of 5.6 years (range 1-13 years), 48% Gartland II, 26% of Gartland III, 26% of Gartland IV. 22 fractures were managed with the crosswire configuration (15.06%); 24 fractures with 2 diverging radial wires (16.43%); 88 fractures with 2 diverging radial and 1 ulnar wire (60.27%) and 8 fractures with 3 radial wires (5.47%).

Whereas at baseline a worse MEPI score was observed in more complex fracture patterns, at 3-months follow-up, the MEPI score showed optimal values in all study groups and no significant differences between groups were observed.

The carrying angle and Baumann angle reached normal values after surgery. No significant loss of correction, Flynn's criteria restored at the final follow-up, without significant differences between groups.

In our sample there is no significant better treatment for displaced supracondylar fractures of the humerus.

## China's initiatives for the rare disease databases

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Rare disease (RD) is a worldwide challenge with more than 7,000 types and affects approximately 10% of the entire world population. China is home to the second-largest RD population (approximately 20 million, following the 25 million in the United States), comprising as many as 56 ethnic groups. China lacked sufficient RD input before the 21st century, resulting in an enormous loss of statistics and database information. China is now making swift progress on the construction of RD databases. Two Chinese RD databases were completed by 2022. The Chinese National Rare Disease Registry System (NRDRS) integrates the research and case information of RDs within China. Another database, the 'Rare Disease Data Centre (RDDC)', focuses on the full utilisation of genetic big data for the development of bioinformatics AI tools. The Chinese RD database will supplement current databases based on Western populations. On 5th January 2024, the 'China Rare Disease Comprehensive Cloud Service Platform - Digestive Rare Disease Database Project' was launched in Beijing. Two days after (7th January), the 'China Rare Disease Comprehensive Cloud Service Platform - Myasthenia Gravis Database Project' was launched in Shanghai. The aim was to initiate the registration of patients with corresponding RDs. On the same day, the Sixth People's Hospital affiliated with Shanghai Jiao Tong University initiated a collaboration with University College London to establish the first Chinese-British joint proteomics database for Ewing's sarcoma patients. There are numerous RDs related to orthopaedics. We hereby introduce the progress and advocate more scientists and clinicians to join.

## Collagen methacryloyl (ColMA)/PEGDA ink for digital light processing printing

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The fabrication of three-dimensional (3D) biostructures through additive manufacturing relies on the critical role of ink development. With the growing demand for high-resolution manufacturing, digital light processing (DLP) technology has emerged as a promising technique requiring specialised photosensitive inks. Although gelatine methacryloyl (GelMA) has been the primary option for DLP, its mechanical properties, biocompatibility, and low stability still present limitations in orthopaedic applications. The development of collagen-based ink is thus in high demand for a wider stiffness adjustment range, native bioactivities, and versatility in biomedical engineering applications. In this study, we reported a rapid and low-cost protocol for collagen methacryloyl (ColMA)/poly(ethylene glycol) diacrylate (PEGDA) ink for DLP printing. The ink demonstrated the highest printing resolution of  $\sim 50 \mu\text{m}$  by using 405 nm visible light. The printability, mechanical properties, and cell viability of the DLP-printed ColMA/PEGDA structures were comprehensively evaluated. The printed ColMA/PEGDA structures reached a compressive modulus over 100 kPa with 0.6 wt% collagen. The printed ColMA/PEGDA scaffolds promoted the attachment and proliferation of 3T3 fibroblasts, demonstrating their potential in future applications in orthopaedics.

## What role does the novel epiligament theory play in ligament healing?

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**Aim:** This study aims to assess the early healing process in the epiligament (EL) of the medial collateral ligament (MCL) in a rat model and compare it with EL tissue in humans. **Materials and Methods:** Ten 8-month-old male Wistar rats and ten fresh human cadavers were utilized to examine the EL of the MCL. The ligaments were examined via light and transmission electron microscopy on the eighth, sixteenth, and thirtieth days after sacrifice. Additionally, we conducted a comparative analysis between the EL of the human MCL and that of rats. **Results:** The external surface of the EL in both rat and human MCL exhibits similarities, characterized by the presence of fibroblasts, fibrocytes, adipocytes, mast cells, neurovascular bundles, and abundant multidirectional collagen fibers. In the rat model of MCL injury, the EL effectively bridged the gap between the two ends of the MCL following injury. **Conclusion:** This study revealed that the EL is the main source of fibroblasts, progenitor cells and blood vessels that ensure early MCL healing, which led to the formation of the new epiligament theory for MCL healing. Moreover, the EL of rat and human are similar.

## Pathological classification of idiopathic carpal tunnel syndrome focusing on transthyretin amyloid deposition in the carpal tunnel synovium

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**Introduction:** This study aimed to clarify the differences in the pathogenesis of CTS among middle-aged women, elderly women, and elderly men who are at the peak of CTS incidence, with a focus on the presence of transthyretin amyloid deposition. **Methods:** Intraoperative intracarpal tunnel synovium was obtained from patients who underwent surgery for idiopathic CTS, and the presence of TTR deposition in the synovium was evaluated by immunohistochemical staining. Fibroblasts were extracted from the remaining intracarpal synovium and divided into three groups: TTR-negative middle-aged women, TTR-positive elderly women, and TTR-positive elderly men, with 10 subjects in each group. The expression of fibrosis-related genes such as Col1 $\alpha$ 1, Col1 $\alpha$ 2, Col3 $\alpha$ 1, TGF- $\beta$ 1, and  $\alpha$ SMA in fibroblasts collected from the intracarpal tunnel synovium was compared among the three groups using real-time PCR. In addition, BCTQ scores were compared preoperatively and 3 months postoperatively for clinical evaluation. **Results:** Col1 $\alpha$ 1, Col1 $\alpha$ 2, Col3 $\alpha$ 1 and TGF- $\beta$ 1 were significantly upregulated in the TTR-positive elderly women compared to those in the TTR-negative middle-aged women and TTR-positive elderly men. In the TTR-negative middle-aged women, the BCTQ-SS significantly improved at 3 months postoperatively compared to that preoperatively. **Conclusion:** This study identifies synovial fibrosis as a key factor in CTS among TTR-positive elderly females, exhibiting no enhancement in BCTQ scores post-operatively, suggesting TTR-associated neuropathy. Conversely, TTR-negative middle-aged females, demonstrating absence of fibrosis yet presenting improved BCTQ scores post-surgery, imply that elements such as synovial edema could contribute to compression.

## Comparison Between Autologous Bone and Bone Morphogenetic Protein 2 in Bone Regeneration Using New Masquelet Technique Rabbit Model

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**Introduction:** The Masquelet technique is a relatively new treatment for critical-sized bone defects. However, autologous bone grafting (ABG)-related pain and bleeding are concerning. Recently, using bone morphogenetic protein 2 (BMP-2) for non-invasive bone regeneration therapy has attracted attention, but its difference from ABG remains unknown. Here, we created a new Masquelet technique rabbit model and compared the bone regenerative effects between ABG and  $\beta$ -tricalcium phosphate ( $\beta$ -TCP) granules containing BMP-2.

**Methods:** This study used 24 weeks-old New Zealand white rabbits. In the first surgery, a 20-mm defect was created in the femur, which was internally fixed and filled with bone cement. In the second surgery, the bone cement was removed after 4 weeks. The ABG (n=13) and BMP-2 (n=8) groups were filled with iliac bones and  $\beta$ -TCP containing BMP-2, respectively. Twelve weeks after the second surgery, bone union and regeneration were evaluated radiologically, histologically, and biomechanically.

**Results:** Radiography showed good bone union in both groups. Bone union was better in the BMP-2 group than that in the control group, but the difference was not statistically significant. Histological evaluation showed good bone regeneration in both groups. Biomechanical evaluation showed no significant differences in the ultimate stress, extrinsic stiffness, and failure energy; however, they were higher in the ABG group.

**Discussion:** Although the BMP-2 group was mechanically weaker than the ABG group, the results suggest that bone regeneration treatment with BMP-2 is equivalent to and may eliminate the need for ABG.

## Development of Shrimp Shell Carboxymethyl Chitosan Nanofibrous Scaffold for Meniscus Tissue Engineering

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Meniscus tears are a challenging problem in the orthopedic field, and tissue engineering has been widely investigated to address this issue. The purpose of our research is to develop a biomimetic nanofibrous scaffold from chitosan extracted from shrimp shells for meniscus tissue engineering. Our previous work showcased the successful fabrication of nanofibrous scaffolds from poly(lactic acid) (PLA) and commercial chitosan (CS-C) using the electrospinning technique. Chitosan ordinarily dissolves in acidic solutions, which are distinct from the knee's microenvironment and could affect the antibacterial properties of the chitosan. For this reason, we intended to modify chitosan to be water-soluble. Chitosan was prepared from shrimp shells, which are an industrial waste in Thailand, and modified by monochloroacetic acid to form carboxymethyl chitosan (CMCs). The CMCs with carboxymethyl groups were confirmed by the degree of substitution (%DS) and a water solubility test. Electrospinning of 6% PLA with 2% CS-C and 6% PLA with 2% CMCs was fabricated and characterized. The morphology of PLA/CS-C and PLA/CMCs scaffolds revealed a random distribution with interwoven spaces and also exhibited hydrophobicity. The mechanical properties (tensile strength, elongation at break, and Young's modulus) of both groups showed no statistically significant difference. The viability of human cartilage stem/progenitor cells seeded in both scaffold groups increased from day 7 to 14. Additionally, this scaffold exhibited antibacterial properties against *Staphylococcus aureus*, meeting FDA standards. In conclusion, our study demonstrated that the shrimp shell carboxymethyl chitosan nanofibrous scaffold has the potential for use as a biomimetic scaffold for meniscus tissue engineering.

## Preventive effect of transcutaneous CO<sub>2</sub> application on disuse osteoporosis and muscle atrophy in a rat hindlimb suspension model

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**Objectives:** Transcutaneous CO<sub>2</sub> application promotes muscle fiber-type switching, fracture healing, and osteogenesis via angiogenesis. This study aimed to investigate the preventive effects of transcutaneous CO<sub>2</sub> application on disuse osteoporosis and muscle atrophy using a rat hindlimb suspension model. **Methods:** 11-week-old male Sprague-Dawley rats were divided into hindlimb suspension (HS), HS with transcutaneous CO<sub>2</sub> application (HSCO<sub>2</sub>), and control groups (CON). Hindlimb suspension was done with their tail hung from the cage ceiling. Transcutaneous CO<sub>2</sub> application was performed by sealing their legs in a polyethylene bag filled with 100% CO<sub>2</sub> for 20 minutes, five times a week. After three weeks, we harvested the gastrocnemius, femur, and tibia for assessment. **Results:** The histological cross-sectional area of gastrocnemius myofiber was significantly decreased in HS compared with CON, whereas it was significantly increased in HSCO<sub>2</sub> compared with HS.  $\mu$ CT revealed atrophy of femur in HS compared with CON, and significant improvement in HSCO<sub>2</sub>. Histological analysis of the proximal tibia in HS revealed more marrow adipose tissue than CON. However, HSCO<sub>2</sub> demonstrated fewer marrow adipose tissue, and osteoclasts, more osteoblasts, and higher expression of PGC-1 $\alpha$  and VEGF compared to HS. Real-time RT-PCR revealed elevated expression of myogenesis and angiogenesis markers in HSCO<sub>2</sub> gastrocnemius compared to HS, and opposite changes in atrophic markers. In the distal femur, the osteogenesis and angiogenesis markers were also up-regulated in HSCO<sub>2</sub> compared to HS. **Conclusion:** Transcutaneous CO<sub>2</sub> application effectively was suggested to prevent disuse osteoporosis and muscle atrophy in a rat hindlimb suspension model by activating the angiogenic pathway.



## The Effect of Probiotic *Lactobacillus Plantarum* on Fracture healing

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The efficacy of probiotics in promoting fracture healing remains to be fully established. This investigation explored the potential of the probiotic *Lactobacillus plantarum* TWK10 (TWK10), in combination with bio-ceramic implants, in a rat femoral fracture model. We assessed the short-term (4 weeks) and mid-term (12 weeks) impact of this probiotic through micro-CT and histological analyses.

The micro-CT examinations confirmed successful implant integration and disclosed enhanced bone thickness in rats receiving TWK10 supplementation. Histological examination demonstrated an increase in active osteoblasts and lamellar bone, alongside elevated levels of SATB2, a transcription factor essential for osteogenesis. These findings contribute valuable insights into the role of probiotic TWK10 in expediting bone healing in rats, offering a potential avenue for the development of immune-osteogenesis therapies for fractures.

## Fecal microbiota transplantation from postmenopausal osteoporosis human donors accelerated bone mass loss in mice

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**Objectives:** To investigate the effect of gut microbiota from postmenopausal osteoporosis patients on bone mass in mice.

**Methods:** Fecal samples were collected from postmenopausal women with normal bone mass and postmenopausal women with osteoporosis. Fecal samples were transplanted into pseudo-sterile mice previously treated with antibiotics for 4 weeks. These mice were categorized into two groups: the Vehicle group (n=7), which received fecal samples from individuals with normal bone mass, and the FMT group (n=7), which received fecal samples from individuals with osteoporosis. After 8 weeks, bone mass, intestinal microbial composition, and intestinal permeability were assessed, then followed by a Spearman analysis.

**Results:** The bone mass in the FMT group was significantly reduced, the medullary cavity was enlarged, and the bone trabeculae were reduced. The diversity of recipient mice in the FMT group was significantly different from that in the Vehicle group ( $P < 0.05$ ). Compared with The Vehicle group, The abundance of *Enterorhabdus caecimuris* (0.07vs0.01,  $p < 0.05$ ). *Alistipes finegoldii* (0.016 vs 0.005,  $p < 0.01$ ) and *Lactobacillus gasserii* significantly enriched which were the key flora related to bone loss. FMT decreased the expression of intestinal tight junction-related proteins claudin, and ZO-1 ( $p < 0.05$ ). Spearman analysis showed that the dominant bacteria in FMT were significantly correlated with bone tissue parameters and enriched enzymes in the FMT group.

**Conclusion:** The clinical phenotype of osteoporosis could be transferred by gut microbiota.

## synchrotron tomography-based finite element analysis improves accuracy of predicted load transmission in the vertebral endplates

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**Introduction:** Lower back pain is associated with vertebral biomechanics. Vertebral endplates play a key role in load transmission. Synchrotron computed tomography (sCT) allows for visualisation of the microstructure of intact endplates under near-physiological loads. sCT, coupled with digital volume correlation (DVC), can be applied to quantify 3D strain fields. In this study, we coupled DVC data and a finite element model (FEM) to determine the biomechanical properties of a murine endplate, then the model was extended to disease conditions. **Method:** In situ sCT and DVC of murine spine segments (L4/L5) were performed. A FEM of the spine segments and a Global Search optimisation pipeline were created to optimise the material properties of the endplates. Bland-Altman analysis was performed to validate the DVC: FEM strain agreement. The optimised FEM was then utilised to predict the strain distribution in the endplates under disease conditions (degeneration and osteoporosis). **Results:** To improve the prediction accuracy of FEM, a global optimal combination of elastic modulus = 67.9 MPa and Poisson's ratio = 0.215 was identified. It shows 95.9% agreement of quantitative difference and spatial correlation between DVC and FEM strains. The degenerative and osteoporotic endplates failed to dissipate loads through the annulus fibrosus, predicting concentrated strains at specific locations of the spine. **Conclusion:** This study validated the efficacy of using DVC results to increase FEM prediction accuracy. The endplates are crucial for load transmission. In simulations, locations with high fracture risk were predicted. The methodologies can potentially be scaled up to large animals and humans.

## Characterization of Growth Factors, Cytokines, and Chemokines in Bone Marrow Aspirate Concentrate: A Prospective Analysis

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**Introduction:** Bone marrow aspirate concentrate (BMAC) is an orthobiologic therapy with numerous growth factors and other bioactive molecules. Before the clinical utility of BMAC is optimized as a combined therapy or monotherapy, an improved understanding of the components and respective concentrations is necessary. We aimed to prospectively measure and compare anabolic, anti-inflammatory, and proinflammatory growth factors, cytokines, and chemokines in BMAC from samples collected and processed concurrently on the same day from patients presenting for elective knee surgery. **Materials and methods:** Patients presenting for elective knee surgery were prospectively enrolled over a 3-week period. BMA from the anterior iliac crest was immediately processed via centrifugation methods to prepare BMAC samples. BMAC were immediately assayed and analyzed to measure protein concentrations. **Results:** BMAC had a significantly higher interleukin 1 receptor antagonist (IL-1Ra) concentration. There were no significant differences in IL-1Ra concentration based on age, sex, body mass index, or chronicity of injury in all preparations. BMAC had significantly higher concentrations of platelet-derived growth factor AA (PDGF-AA) and PDGF-AB/BB ( $P < .0006$ ). BMAC also had significantly higher concentrations of matrix metalloproteinase 1 (MMP-1) and soluble CD40 ligand ( $P < .004$ ). BMAC had significantly higher concentrations of MMPs, namely MMP-2, MMP-3, and MMP-12 ( $P < .0001$ ). **Conclusion:** BMAC is a clinically relevant source of anti-inflammatory biologic therapy that may be more effective in treating osteoarthritis and for use as an intra-articular biologic source for augmented healing in the postsurgical inflammatory and healing phases, owing to its significantly higher concentration of IL-1Ra.

## Influence of vancomycin and meropenem loading on compressive strength of polymethylmethacrylate bone cement

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**Introduction:** The rise of antibiotic resistance of bacteria to commonly used agents in antibiotic – loaded polymethylmethacrylate (PMMA) bone cement leads to search for new antibiotic agents. Double antibiotic loading widens the antimicrobial spectrum and improves antibiotic elution compared to single antibiotic. Antibiotic loading alters the mechanical properties of PMMA. The purpose of this study is to test compressive strength of bone cement loaded with vancomycin, meropenem or their combination. **Material and methods:** 90 samples of Smart Set Endurance™MV, DePuy Synthes containing PMMA only, PMMA+2,5%w/w vancomycin, PMMA+2,5%w/w meropenem, PMMA+1,25%w/w vancomycin and 1,25%w/w meropenem and PMMA+2,5%w/w vancomycin and 2,5%w/w meropenem were prepared according to specifications of ISO5833:2002 international standard. Half of the samples were tested for compressive strength in 24 hours; the other half was tested after incubation of 28 days at 37°C in Ringer's solution. **Results:** All tested groups had compressive strength significantly above the minimal value of 70MPa set by the standard (87.9–98.6MPa). All groups of antibiotic-loaded cement had significantly lower compressive strength than PMMA. Cement aging caused significant increase of compressive strength in all groups (range 5.1% to 11.9%). PMMA+2,5%w/w vancomycin and 2,5%w/w meropenem is significantly weaker to compression then other groups after aging, however its compressive strength is significantly above the minimally required value (88MPa at 24 hours, 92.5MPa aged). **Conclusion:** All tested groups fulfil basic compressive strength criteria for clinical use in arthroplasty procedures. Biomechanical properties of PMMA are not definitive after cement setting and they change with aging.

**Keywords:** PMMA, antibiotic-loaded bone cement, compressive strength

## Estrogen deficiency exacerbates traumatic heterotopic ossification in mice

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Traumatic heterotopic ossification (HO) is a devastating sequela following orthopedic surgeries and traumatic injuries, but few studies have explored the effects of the estrogen-deficient state on HO formation. In the present study, female C57BL/6 mice were randomly divided into three groups: sham-operated (control), estrogen depletion by ovariectomy (OVX) and OVX with 17 $\beta$ -estradiol supplementation (OVX + E2). Three weeks after OVX, all mice were subjected to an Achilles tenotomy to induce HO. Mice in the OVX group formed more ectopic cartilage at 3 weeks after tenotomy as well as ectopic bone at 9 weeks after tenotomy compared with the control group. Estrogen deficiency resulted in more severe inflammatory infiltration at the injury sites at 1 weeks after tenotomy, involving the recruitment of more macrophages and mast cells, as well as increasing the expressions of pro-inflammatory mediators including IL-1 $\beta$ , IL-6 and TNF- $\alpha$ . Moreover, local TGF- $\beta$ /SMAD signaling pathway dysregulated after OVX, which manifested as up-regulated expressions of TGF- $\beta$  and pSMAD2/3. E2 supplementation could well protect against OVX-induced HO deterioration, inhibit the inflammatory infiltration and downregulate the TGF- $\beta$ /SMAD signaling pathway. In conclusion, estrogen deficiency exacerbates HO formation in the Achilles tenotomy model. These findings may be attributable to the disturbance of the inflammatory response and the activation of TGF- $\beta$ /SMAD signaling at the injury sites in the early stages of HO development.

## Arteriogenesis mechanism in remodeling of choke vessels within delayed multiterritory perforator flap

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This study is to investigate the role of the arteriogenesis mechanism in remodeling of the choke vessels within the harvested and delayed multiterritory perforator flaps, and to clarify protein molecular mechanism in remodeling of these choke vessels. The Sprague-Dawley (SD) rats were divided into several groups according to different procedures, and morphology, hemodynamics, and expressions of protein molecules were carried out. The radiographs of the perfused integuments displayed the changes of choke vessel in the choke zones. The blood perfusions in the choke zone 1 and choke zone 2 were measured using the Laser Doppler flowmeter. The expressions of the protein molecules including TRPV4, VE-cadherin, eNOS, iNOS, VEGFA, ICAM-1, FAK, CX-37, CD11b, CD163, MMP-2, MMP-9, PLGF, Ki67, Ephrin B2, HIF1- $\alpha$  and HSP70, were evaluated spatially, qualitatively and semi-quantitatively on the time points of pre-operation, and 1d, 3d, 5d, 7d postoperatively by immunohistochemistry technique. 1. The morphological and hemodynamic changes in this study support that the arteriogenesis mechanism plays an important role in the remodeling of the choke vessels in the choke zone 2 within the multiterritory perforator flaps after three types of delay procedures. 2. The temporal and spatial expresses of the protein molecules associated with the collateral artery development are closely related to the remodeling of the choke vessels in the choke zone 1 and 2 within a multiterritory perforator flap after the flap is harvested or delayed, and the arteriogenesis mechanism probably plays an important role in the remodeling of these choke vessels.

## Comprehensive analysis of m6A RNA methylation modification patterns and the immune microenvironment in osteoarthritis

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Considerable attention is now being given to the impact of m6A RNA methylation modification on the disease immune regulation. However, much remains unknown about the function of m6A modification in osteoarthritis (OA). In our study, we comprehensively examined the m6A regulators mediated RNA methylation modification pattern in OA, and evaluate the impacts of distinct patterns on the characteristics of OA immune microenvironment. We found most of m6A regulators was differentially expressed in OA samples. We developed a classifier to distinguish OA patients from healthy individuals. We noted that immune characteristics of OA were correlated with m6A regulators. For instance, YTHDF2 had a strongest significantly positive correlation with regulatory T cells (Tregs) and IGFBP2 was strongest negatively associated with dendritic cells (DCs), which were confirmed by the immunohistochemistry (IHC) staining. Two distinct m6A modification patterns were determined: pattern B had higher infiltrating immunocytes and more active immune responses than pattern A, and two patterns differed in the expression of HLA genes. We also identified 1,592 m6A phenotype-related genes that could mediate the OA synovitis and cartilage degradation by the PI3K-Akt signaling pathway. Quantitative real-time polymerase chain reaction (qRT-PCR) results indicated that IGFBP2 was significantly overexpressed, while YTHDF2 mRNA expression was decreased in OA samples, which was consistent with our findings. Our research proves the essential impact of m6A RNA methylation modification on the OA immune microenvironment, and helps to explain the regulatory mechanism behind it, which may open up a new direction for more precise immunotherapy of osteoarthritis.



## DNA demethylation of promoter region orchestrates SPI-1-induced ADAMTS-5 expression in articular cartilage of osteoarthritis mice

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Recent advances in osteoarthritis (OA) research have clearly shown that OA development is associated with aberrant DNA methylation status of many OA-related genes. As one of most important cartilage degrading proteases in OA, a disintegrin and metalloproteinase with thrombospondin motifs subtype 5 (ADAMTS-5) is activated to mediate cartilage degradation in human OA and experimental murine OA models. The pathological factors and signaling pathways mediating ADAMTS-5 activation during OA development are not well defined and have been a focus of intense research. ADAMTS-5 promoter is featured by CpG islands. So far there have been no reports concerning the DNA methylation status in ADAMTS-5 promoter during OA development. In this study, we sought to investigate DNA methylation status in ADAMTS-5 promoter, the role of DNA methylation in ADAMTS-5 activation in OA, and the underlying mechanisms. The potential for anti-OA intervention therapy which is based on modulating DNA methylation is also explored. Our results showed that DNA methyltransferases 1 (Dnmt1) downregulation-associated ADAMTS-5 promoter demethylation played an important role in ADAMTS-5 activation in OA, which facilitated SPI-1 binding on ADAMTS-5 promoter to activate ADAMTS-5 expression. More importantly, OA pathological phenotype of mice was alleviated in response to Dnmt1-induced DNA methylation of ADAMTS-5 promoter. Our study will benefit not only for deeper insights into the functional role and regulation mechanisms of ADAMTS-5 in OA, but also for the discovery of disease-modifying OA drugs on the basis of ADAMTS-5 via modulating DNA methylation status.

## Remodeling articular immune homeostasis with an efferocytosis-informed nanoimitator mitigates rheumatoid arthritis in mice.

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Massive intra-articular infiltration of proinflammatory macrophages is a prominent feature of rheumatoid arthritis (RA) lesions, which are thought to underlie articular immune dysfunction, severe synovitis and ultimately joint erosion. Here we report an efferocytosis-informed nanoimitator (EINI) for in situ targeted reprogramming of synovial inflammatory macrophages (SIMs) that thwarts their autoimmune attack and reestablishes articular immune homeostasis, which mitigates RA. The EINI consists of a drug-based core with an oxidative stress-responsive phosphatidylserine (PtdSer) corona and a shell composed of a P-selectin-blocking motif, low molecular weight heparin (LMWH). When systemically administered, the LMWH on the EINI first binds to P-selectin overexpressed on the endothelium in subsynovial capillaries, which functions as an antagonist, disrupting neutrophil synovial trafficking. Due to the strong dysregulation of the synovial microvasculature, the EINI is subsequently enriched in the joint synovium where the shell is disassembled upon the reactive oxygen species stimulation, and PtdSer corona is then exposed. In an efferocytosis-like manner, the PtdSer-coroneted core is in turn phagocytosed by SIMs, which synergistically terminate SIM-initiated pathological cascades and serially reestablish intra-articular immune homeostasis, conferring a chondroprotective effect. These findings demonstrate that SIMs can be precisely remodeled via the efferocytosis-mimetic strategy, which holds potential for RA treatment.

## Does proteome of osteoarthritic cartilage different between varus and valgus knees? Insights from proteomic analysis

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**Purpose:** The aim of our study was to elucidate whether there is difference in the proteome distribution between distinct phenotypes namely varus and valgus osteoarthritic knees in response to variations in loading conditions. **Methods:** Proteomic analysis was performed on cartilage tissues isolated from weight-bearing and non-weight-bearing regions of varus and valgus knees. There were 8 samples taken in each group. The proteomic analyses comprised extraction of soluble proteins from cartilage, separation of the protein mixtures followed by in-solution digestion, extracts were subjected to precipitation and subsequent tandem mass spectrometry analysis in conjunction with a database search for protein identification and semi-quantitation. Differential analysis was carried out using metaboanalyst software. **Results:** 133 proteins were unique to OA with valgus and 231 proteins were found to be unique in OA with varus. Totally, 92 proteins were up regulated and 108 proteins were down regulated in OA with varus compared to OA with valgus. Unique proteins of valgus were mainly enriched for neutrophil extracellular trap formation and complement and coagulation cascade. Unique proteins of varus were localized in extracellular space and extracellular region. Molecular functions are associated with Ag binding, LPS binding and serine type endopeptidase activity. **Conclusion:** Significant difference in the proteome between OA with valgus deformity and OA with varus deformity was observed using proteomics analysis. Varus proteins are enriched with immune response proteins and valgus proteins are enriched with ECM related proteins. Our findings provide a theoretical basis for targeting OA cartilage proteins to slow down the progression of OA.

## Comparative outcome analyses of intraarticular versus subchondral stromal vascular fraction (SVF) injection in primary osteoarthritis knee

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**Introduction:** The recent developments and impulses in molecular and regenerative medicine have paved the way for inducing biologically active cells such as stem cells, bioactive materials, and growth factors towards the healing and tissue regenerative process. In this connotation, we have compared the effectiveness of subchondral and intraarticular stromal vascular fraction therapy in the early stages of osteoarthritis knee. **Methods:** A prospective randomized controlled clinical trial was carried out between 2019 and 2021 in 60 knees of 30 patients with painful bilateral knee osteoarthritis with early stages of osteoarthritis. The patient-reported pain outcome measures (VAS, NPRS) and functional outcome measures (KOOS, WOMAC, KSS) were obtained. After randomization, the prepared SVF (6ml each) was delivered to the subchondral bone of the femur and tibia of one knee (subchondral group), and the other part was injected intraarticularly (3ml) for the contralateral knee (intra-articular group). The healing of subchondral bone lesions (bone marrow lesions) & the integrity of cartilage during pre and post-procedural follow-up with intraarticular and subchondral SVF in primary osteoarthritis knees via MOCART score at a 2-year follow-up were studied. **Results:** At two-year follow-up, clinical and imaging (MRI) improvement was higher on the side that received cells in the subchondral bone. After 3 months of follow-up, the subchondral group showed significant improvements in all scores when compared to the intraarticular group. **Conclusion:** The subchondral route of administering SVF offers a better modality of treatment for knee osteoarthritis when compared to the intra-articular route.

## Molecular mechanisms in hydroxyapatite nanorod-guided bone mineralisation

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Liquid crystalline (LC) arrangement such as bone is characterised by self-assembly into hierarchical long-range ordered structures with outstanding mechanical strength and complex biofunctions. However, there is not sufficient evidence showing the molecular mechanisms behind the LC structure-guided bone mineralisation. In this study, we synthesised LC hydroxyapatite (HAp) nanorods, which can be manipulated into long-range uni-directional order. After seeding human bone marrow-derived stem cells onto the uni-directional nanorod sheet, we investigated the gene expression patterns and potential protein interactions in HAp nanorod-guided mineralisation using bioinformatics. The key genes COL1A1 and COL4A6 and a PI3k-Akt signalling pathway were identified to be pivotal in extra cellular matrix (ECM) alignment and activation signalling cascade. Our results demonstrate evidence depicting the mechanism of LC-induced anisotropic calcium deposition at the molecular level, shedding more important insight on bone regeneration. It may also inspire biomimetic artificial bone and implant design and fabrication, and studies on more types of biological LC for medical applications in the future.

## Treatment Injury in New Zealand, Review of 1500 Orthopedic claims by a single surgeon

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**Introduction:** In 1974, New Zealand introduced a state-funded universal no-fault Accident Compensation Scheme, commonly referred to as "ACC," aimed at providing coverage for injured individuals. The ACC Act underwent an amendment in 2005 to extend coverage to patients experiencing "treatment injuries" – those resulting from medical errors or mishaps during treatment by registered health professionals. **Methodology:** A comprehensive analysis was conducted on a series of 1501 cases, evaluated by a single orthopaedic surgeon, to assess various parameters such as age, sex, diagnosis, basis for the claim, and causation for ongoing symptoms (including pre-existing conditions, new structural injuries, unexpected complications, surgical errors or misdiagnoses, and ordinary consequences of surgery). Data analysis was carried out using Excel version 16.34, and opinions were grounded in evidence-based medicine principles. **Results:** This study focused on evaluating 1500 orthopaedic patients meeting the criteria for "treatment injury." The majority (85%) of these cases pertained to claims arising from spine, hip, knee, and foot surgeries, with a mean age of 52.6 years. **Summary:** The cost-effectiveness of the treatment injury scheme renders it advantageous for the country. The absence of a culture of blame and shame has fostered increased confidence among health professionals in reporting treatment injuries and complications. However, it is crucial to recognize that not all surgical complications qualify as treatment injuries. Factors such as the rarity of complications, severity of injury, involvement of defective implants, technical inadequacies, and missed diagnoses serve as indicators of treatment injuries. Injuries related to different regions of the body are discussed.

## Treatment Injury of the Knee In New Zealand

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<sup>1</sup>Private, Melbourne, Australia

Introduction: In 1974, New Zealand adopted a state-funded universal no-fault compensation scheme, the "ACC," to provide coverage for injured individuals. The ACC Act was amended in 2005 to include coverage for patients suffering from "treatment injuries" (medical errors and mishaps) caused because of treatment by a registered health professional. Methodology: A series of 1500 cases, assessed by a single orthopaedic surgeon, were analysed. Among them, 223 claims were for injuries of the knee. These cases were examined for various parameters, including age, sex, diagnosis, basis for the claim, and causation for ongoing symptoms (such as pre-existing conditions, new structural injuries, unexpected complications, surgical errors or misdiagnoses, and ordinary consequences of surgery) using Microsoft Excel version 16.34. Results: Injuries related to total knee arthroplasty (TKA) accounted for 63% of the claimed knee treatment injury cases. The mean age of the patients was 56 years. Injuries related to pre-existing conditions, refusal to provide consent, failure to achieve desired results, or ordinary consequences were not considered as treatment injuries. Summary: TKA is one of the most performed knee surgeries. Common treatment claims include instability (22%), infection (19%), loosening (29%), arthrofibrosis (18%), and periprosthetic fracture (5%). It is important to note that not all surgical complications are considered as treatment injuries. Furthermore, 22% of knee claims were found to be preventable.

## Methodological Designs of Two Phase III Clinical Trials Evaluating RTX-GRT7039, A Novel agonist of Transient Receptor Potential Vanilloid 1, for Osteoarthritis Knee Pain

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Background: RTX-GRT7039 (resiniferatoxin), is a potent and selective agonist of the transient receptor potential vanilloid 1 (TRPV1). Activation of TRPV1-expressing neurones by RTX-GRT7039 is followed by reversible defunctionalisation of nociceptive nerve fibres that can lead to prolonged analgesia.

RTX-GRT7039 is currently being evaluated in two pivotal Phase III clinical trials (KF7039-01 and KF7039-02) for its efficacy and safety in treating moderate-to-severe OA knee pain.

Methods: Both trials are multi-centre, multi-national, double-blind, randomized, placebo-controlled, and parallel-group in design, enrolling approximately 450 participants each with outcomes measured through 52 weeks. KF7039-01 involves two intra-articular injections of RTX-GRT7039 or placebo, six months apart and KF7039-02 tests a single injection. The primary endpoint is change in the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain subscale score in the index knee from baseline to Week 12, assessed using an 11-point numeric rating scale.

Secondary objectives include change in WOMAC pain, physical function and stiffness subscale scores, and the proportion of participants with significant pain reduction at time points up to Week 52. In addition, patient global impression of change (PGIC) and quality of life assessments using EQ-5D-5L and SF-36 are included. Both studies capture safety and tolerability outcomes throughout.

Results: Status of KF7039-01 and KF7039-02 will be updated routinely on [www.clinicaltrials.gov](http://www.clinicaltrials.gov); NCT numbers are NCT05248386 and NCT05449132, respectively.

Conclusions: If safety, tolerability and efficacy are confirmed, RTX-GRT7039 has real potential as a novel, non-opioid therapeutic option, to provide significant pain relief and functional improvements for individuals suffering from OA of the knee.



## Autologous Bone Marrow Aspiration Concentrate (BMAC) Therapy for Primary Knee Osteoarthritis – An Observational and Dose Escalation Study

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**Introduction:** Anti-inflammatory and anti-fibrotic properties maximize the therapeutic potential of BMAC in OA knee. There is a lack of studies to standardize the treatment procedure to make the studies done across various centers to be comparable to better understand the lacunae and develop further on the deficiency in our understand of BMAC for OA knee. We aimed to assess the degree of pain relief, functional outcome, and cartilage thickness with different doses of BMAC in primary OA knee. **Materials and methods:** A single-centered prospective observational study was conducted with 60 patients of OA knee who are divided into 3 groups where group A (n=20), group B (n=20), and group C(n=20) received 1, 2, and 5 million BMAC cells per kg body weight. All patients were followed up with VAS, WOMAC, IKDC and MOCART scores both pre and post procedurally at the end of 1, 3, 6 and 12 months. **Results:** All patients in all the groups represented with pain relief with the improvement in VAS scores. The functional improvement was observed in group B with improvement in WOMAC, IKDC and MOCART scores which was statistically significant ( $p < 0.001$ ). No adverse events were noted in the study. **Conclusion:** A dose of 2 million BMAC cells per kg body weight for knee OA serves the better regenerative modality of choice in cartilage regeneration. With our dose escalation study, we would able to standardize the treatment procedure and enable global comparison of the treatment method across various regions of the world.

## Using Of Intraoperative Cell Salvage and Tranexamic Acid as Protective Factor for Preventing Postoperative Anemia in Patients with Total Hip and Knee Arthroplasty

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**Introduction:** The purpose of this study was to investigate intraoperative pharmacological and nonpharmacological methods and techniques in reducing bloodloss in patients following total hip (THA) or knee arthroplasty(TKA). **Methods:** A retrospective cross-sectional study was conducted in patients undergoing TKA or THA surgery, electively performed at the General Hospital Valjevo, Serbia, in 2014 when the principles of Patient Blood Management (PBM) were not applied at all or in part, and in 2019 when PBM principles were applied as standard. **Results:** In total 197 orthopaedic patients (46 male and 151 female) were included in study. We found that there was significant statistical difference for THA Hb min (postoperative haemoglobin) between tranexamic acid (TXA) only group and TXA + intraoperative cell salvage (ICS) ( $p=0.000$ ) and group ICS only and TXA+ ICS ( $p=0.001$ ). Using multivariate logistic regression and ROC curve analysis, it was shown that the use of TXA with ICS in patients without preoperative anemia reduced the incidence of postoperative anemia (PA) . Post Operative Anemia Risk Index (POARI) score was invented and cut-point value as predictor for PA is (-6). **Conclusions:** Preoperative diagnosis and treatment of anemia are necessary in orthopedic patients since the use of TXA with ICS together strongly reduces PA in patients without preoperative anemia

## The treatment of chronic wounds with boric acid polyurethane sponges combined with negative pressure wound treatment: a multi-center, prospective, randomized study

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**Objective:** This study aimed to compare the outcomes of the use of polyurethane boric acid sponges and sponges containing silver nitrate over the negative pressure wound treatment. **Materials and methods:** The patients were separated as Group 1 (n:30) treated with boric acid group and Group 2 (n:34) treated with silver nitrate group (Group 2). The wound healing of each patient was evaluated quantitatively on a cellular basis from a table of macroscopic and histopathological scoring. **Results:** No statistically significant difference was determined between the groups applied with boric acid and silver nitrate in respect of the culture results from the first visit (p:0.705). In the final evaluation of wound dimensions on day 21, a significant reduction was seen in wound width (p=0.001), wound length (p=0.003), and wound depth (p<0.001) in the boric acid group, and no significant results were obtained in the silver nitrate group. In the quantitative cellular evaluations, a statistically significant difference was determined in favor of the boric acid group in respect of inflammatory cell count, angiogenesis, granulation, and re-epithelialization (p<0.001 for all).

## Effects of autoimmune diseases and *Staphylococcus aureus* on orthopedic infection surgery

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(Introduction) Patients with autoimmune diseases (AIDs) are tend to be infected. *Staphylococcus aureus* (S.A) is the main cause of orthopedic-infection. For orthopedic-surgeons, infections are often hard to treat, and it is important to recognize how these factors affect surgical outcomes.(Methods) We identified 376 patients who were treated for infectious diseases at our hospital from 2013 to 2023, and detected 18 patients with AIDs who underwent orthopedic-surgery (OS) for infections. As a Control group, 19 patients performed OS for infections were randomly selected as same.(Results) The mean values for age, body-mass-index, postoperative change of C-reactive protein (CRP), postoperative change of white-blood-cells (WBC), and duration of hospitalization (DH) were 77.4-year, 21.9 kg/m<sup>2</sup>, -13.79 mg/dL, -4730 / $\mu$ L, and 53.3 days, respectively. The ratio of female, diabetes, AIDs, S.A-infection, and deaths during observation were 27 (69.2%), 12 (30.7%), 18(46.1), 17 (43.6%), and 6 (15.3%), respectively. The types of surgery were amputation, joint surgery, and spine surgery, and the ratio were 4 (10.2%), 21 (53.8%), and 14 (35.9%), respectively. There were no significant differences between AIDs and Control as below; WBC improvement (p=0.15), CRP improvement (p=0.95), DH (p=0.41) and mortality rate (p=0.67). Compared with other bacterial species (Other)-group, S.A-group had significantly greater postoperative CRP-improvement (p=0.01) and significantly longer DH (p=0.01).

(Discussion) AIDs might not affect inflammation-improvement and DH after orthopedic-infection-surgery. S.A-infections might be related to longer DH. However, as Other-infection, OS could be expected to improve inflammation of S.A-infection. Therefore, orthopedic-surgeons might have to perform surgery for AIDs-patients even if S.A related.

## Effect of Cellular Dosage of Bone Marrow Aspiration Concentrate on the Radiological Outcomes in Knee Osteoarthritis? A Phase I Dose Escalation Study

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**Introduction:** Knee osteoarthritis(KOA), a chronic degenerative disease, significantly impairs quality of life due to pain and mobility limitations. Bone marrow aspirate concentrate(BMAC), rich in mesenchymal stem cells and growth factors, has shown potential for cartilage repair and symptom relief in KOA. Despite promising outcomes, the optimal BMAC dosage for knee OA treatment remains undetermined. This study aims to evaluate the radiological outcomes of varying BMAC dosages in KOA treatment. **Methods:** This prospective controlled dose-escalation study involved 75 patients with early-stage knee OA, categorized into three groups based on BMAC dosage administered 10x10<sup>6</sup> cells (low dose group), 50x10<sup>6</sup> cells (medium dose group), or 100x10<sup>6</sup> cells (high-dose group). All the patients underwent a single intra-articular injection of BMAC and were monitored over a year. The primary outcomes include Magnetic Resonance Observation of Cartilage Repair Tissue (MOCART 2.0) score to assess the cartilage. **Results:** We noted significant improvement in the overall MOCART score (p=0.027) and subchondral change sub-score (p=0.048) and defect filling sub-score (p=0.025) in the medium and high dose cohorts compared to the low-dose cohort at one-year follow-up. Although we noted positive correlation between the clinical and radiological outcome (r=0.43), we did not find any significant difference in the clinical outcome between the treatment groups. **Conclusion:** Medium and High doses of BMAC results in significantly higher radiological scores compared to low dose BMAC at one-year. However, the radiological improvement did not translate into functional improvement, irrespective of the dosage administered at one-year.

## Bibliometric analysis of Cricket Injury Research: A Global Perspective

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**Introduction:**Cricket, a widely popular sport has amassed a massive global following of over 1 billion enthusiasts. However, injuries in cricket are a significant concern, negatively impacting player performance and leading to considerable absenteeism from the game. In recent times, there has been a surge in interest in understanding the epidemiology, biomechanics, and prevention of cricket-related injuries. To gain comprehensive insights into the existing research landscape, this study presents a bibliometric analysis of published research on cricket injuries.**Methods:**The Web of Science database was utilized, employing a well-defined search strategy to identify original research articles focusing on injuries in cricket. The obtained search results were then analyzed using the R Bibliometrix package. Bibliometric parameters, including top authors, journals, countries, and keywords, were examined. Co-occurrence networks were generated, and thematic mapping was performed to identify emerging research topics.**Results:**A total of 423 publications from 126 journals were included in the analysis, showcasing a notable increasing trend in the number of publications over time. This is predominantly focused on injuries sustained by fast bowlers, with major research themes centered around epidemiology, consensus definitions and spinal issues in fast bowlers. On the other hand, there was relatively limited research on injuries concerning batsmen, wicketkeepers, and fielders. **Conclusions:**The study reveal that a majority of cricket injury research originates from developed countries. The primary research areas include epidemiology, injury prevention, and biomechanics, with a particular emphasis on fast bowlers. However, there is a need for more research that focus on injuries experienced by batsmen, wicketkeepers, and fielders

## The Epidemiology of Multiple Lower Limbs Joint Replacements in Fife from 1998 to 2021: Understanding the Disease Burden and Predicting Risk Factors

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**Background:** Knee and hip replacement surgeries have revolutionised orthopaedic medicine by providing individuals with debilitating joint diseases with newfound mobility and a better quality of life. These surgical treatments involve the replacement of damaged sections of the knee or hip with artificial implants. **Methods:** This study analyses patients from the Fife region of Scotland (population ~380,000) who underwent knee or hip surgery from 1998 to 2021. The datasets present information about patient demographics, type of surgeries, recovery time, follow-ups, and outcomes, including complications. This work aimed to describe the population having multiple primary lower limb joint replacement surgeries, addressing the gap in the current literature on patients who required two or more knee and hip replacements. **Results:** Surgical procedures in Fife revealed 14,524 surgeries, with Total Knee Replacement (TKR) accounting for 5,636 surgeries (39%) and Total Hip Replacement (THR) for 8,888 surgeries (61%). When analysing patients with multiple surgeries (2128, 14.6%), 400 patients (2.7%) had at least one knee and one hip surgery. Future work will report on the patient demographics of these different groups and explore risk factors associated with the requirement for knee and hip surgeries like obesity, arthritis at younger ages and other comorbidities. **Discussion:** The epidemiology of knee and hip replacements plays a crucial role in understanding the burden of these conditions on the population. A comprehensive analysis of knee and hip replacements offers insightful findings in patients with multiple joint replacements that could improve patient care by modifying the risk factors.

## Aerosol generating procedures in trauma and orthopaedics in the era of the Covid-19 pandemic

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Purpose: COVID-19 pandemic has created havoc all over the globe and spared no one regardless of status, gender, location and ethnicity. There were questions raised if trauma and orthopaedic (T&O) procedures actually generated aerosols? The need for a review of literature highlighting the nature and impact of aerosol generation within T&O surgery was noted. Methods: A comprehensive online search was performed for all published articles in the English language, evaluating AGPs in T&O surgery and the relevant personal protection equipment used. Results: The search strategy populated 43 studies. Six studies were identified as duplicates. The shortlisted 37 studies were screened and nine studies were included in the review. An additional four studies were included from the bibliography review. Conclusion: Most orthopaedic procedures are high-risk aerosol generating procedures (AGPs). Conventional surgical masks do not offer protection against high-risk AGPs. In the current era of COVID-19 pandemic, there is a significant risk to the transmission of infection to the theatre staff. For protection against airborne transmission, appropriate masks should be used. These need proper fitting and sizing to ensure full protection when used.



## MAVRIC Sequence MRI in Patients with Failed Back Syndrome

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**Introduction:** Imaging the spine in patients with new onset symptoms following instrumentation is often hindered by artefacts from metallic implants. The MAVRIC sequence has shown promise in mitigating these challenges in the presence of orthopedic implants. This study aims to assess the efficacy of MAVRIC sequence MRI in patients undergoing spinal instrumentation, presenting with new-onset neck, back, or extremity symptoms. **Methods:** A cohort of one hundred patients who underwent various spinal instrumentation procedures and presented with new-onset symptoms in the neck, back, or extremities underwent MAVRIC sequence MRI. Qualitative analysis employed a five-point scoring system to compare visualization of vertebrae on T2 and MAVRIC sequences. Quantitative analysis involved measuring noise area in the mid-disc cut on both sequences. Interobserver variability of noise area was assessed using intraclass correlation coefficient. The independent sample t-test compared noise area between T2 and MAVRIC sequences. **Results:** Qualitative analysis demonstrated superior visualization with MAVRIC sequence MRI, particularly in areas containing spinal implants, albeit limited efficacy with stainless-steel implants. Quantitative analysis revealed a significant 90% reduction in noise area with MAVRIC sequences compared to T2. Interobserver variability of noise area was minimal. **Conclusion:** MAVRIC sequence MRI effectively suppresses noise generated by titanium implants in patients with previous spine instrumentation surgeries, aiding in the detection of the etiology of new-onset symptoms in failed back syndrome.

## Exploring Temperature Differences in 12-Hour Ex-vivo Perfusion Using Homologous Blood in Rat Amputated Limbs

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**Purpose:** Ischemia time is an important factor in the treatment of traumatic limb amputation. Extracorporeal perfusion of the limb has not been clinically applied, and basic research has been inconclusive regarding optimal conditions. The purpose of this study was to investigate the optimal conditions for extracorporeal perfusion of rat hind-limbs using allogenic blood. **Methods:** Two groups were compared after 12 hours of perfusion: a normothermic (room-temperature) group (23-26°C, n=5) and a warmed group (33-35°C, n=5), in which the perfusion temperature was set close to the body temperature of rats. 4 specimens were collected from lower leg muscles after perfusion. The primary endpoint was the weight ratio of the hindlimb before and after perfusion. Secondary endpoints included histological evaluation of muscle samples with low ischemic tolerance and performed various biochemical tests. Perfusate was exchanged to prevent hemolysis every 3 hours. **Results:** The weight ratios indicated less edema in the normothermia group. Also, histological evaluation showed that muscle fiber damage was better in the normothermic group. Serum potassium and lactate levels were higher in the warmed group at most time points. **Discussion:** Cold preservation of amputated limbs remains the gold standard treatment until reattachment. However, while cold preservation is necessary for organ preservation, it is a compromise between the benefits and detriments of cooling. Perfusate using RBCs is superior in terms of oxygen delivery capacity, maintains aerobic metabolism, and may reduce edema and ischemic injury of the muscle. Hemolysis and thrombosis were well controlled in this protocol.

## Assessment of the physical characteristics of the elderly population

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Introduction: Sarcopenia is mentioned as one of the diseases associated with the aging process.

Methods: This study included respondents - pensioners over 65 years old. Data were collected on age, gender, level of education, marital status, number of household members, whether they live in an apartment or a house, the presence of certain diseases, regular use of medications, and whether the respondents are smokers. Hand grip strength was measured with a dynamometer; SPPB questionnaire.

Results: Out of a total of 70 respondents, 51 of them were female (72.86%) and 19 were male (27.14%). The average value of hand grip measurement with a dynamometer, for both genders, of the right hand is 26.69 kg (SD=10.92; SE=1.31) and the left hand is 26.32 kg (SD=10.29; SE=1.31). The average grip strength of the right hand of men is 39.68 kg (SD=7.67; SE=1.76) and that of the left hand is 40.39 kg (SD=8.71; SE=2.05). The average grip strength of the right hand of women is 22.09 kg (SD=5.81; SE=0.81) and that of the left hand is 21.08 kg (SD=6.29; SE=0.88). The average number of points achieved on the SPPB test is 6.75 (SD=1.32; SE=0.16). Males had slightly better results - 7.28 (SD=1.36; SE=0.32) compared to females - 6.57 (SD=1.27; SE=0.18).

Conclusion: The research results indicate that the results of the SPPB test of the elderly population in Novi Sad are lower compared to the values obtained in other world populations.

Keywords: SPPB questionnaire, hand grip strength, elderly population, sarcopenia

## Knowledge and Attitude of Eastern Provinces' Family Physicians toward Common Orthopedic Surgery Cases

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Orthopedic outpatient departments frequently have lengthy waiting lists and crowded clinics on daily basis. However, most of them do not always need the evaluation of an orthopedic specialist. This paper aim was to evaluate the knowledge and practice of primary care physicians in diagnosis, management, and referral to orthopedic surgery. A cross-sectional study using online surveys was conducted which included commonly seen cases as scenarios with multiple choice options. 92 doctors completed the survey. Almost equal numbers of males and females participated 44 (47.8%) and 48 (52%), respectively. Majority of respondents were residents accounting for 78 (84.8%) with 72 (78.3%) having 1-5 years of experience. Surprisingly, almost one-quarter of participants rate their knowledge as poor 25 (27%) and one-fifth, 12(13%) very poor. 87 (94.6%) answered OA correctly and 60 (65.2%) managed it conservatively. For pediatric orthopedic, around half 55 (59.8%) diagnosed DDH scenario, however 14 (15.2%) would instruct for double diaper wear, and 27 (29.3%) will follow patient up after 3 months and re-evaluate, while 51 (55.4%) will accurately do US and refer the patient to orthopedic surgeon. Still, majority 86 (93.5%) will refer their patients who they fail to improve, 83(90.29%) will refer their patients because they are unsure of the diagnosis. In a lesser extent, 50 (54.3%) decide to refer because physiotherapy is unavailable, and 21 (22.8%) due to patients' request. In conclusion, this finding suggests a gap of knowledge in orthopedic among primary care physicians and actions to improve their clinical training and skills should be taken.

## The utilization of alginate wound coatings with improved antibacterial and regenerative properties in treatment of complex wounds. Preclinical study

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**Introduction:** The purulent complications of wounds of various etiologies represent one of the most urgent problems currently facing modern medicine. The development of ever newer and better drugs, or the modernisation of forms and methods of delivery of existing ones, is currently being driven by the urgent need to combat antibiotic resistance.

**Objective:** The objective of this study is to substantiate the effectiveness of the application of a wound coating based on an alginate matrix with increased antimicrobial and regenerative properties on a purulent wound model. The study was conducted on 50 rats. All animals underwent preliminary immunosuppression. The wound was then created in the withers area by excision of a skin flap. Daily cultures of *Staphylococcus aureus* and *Pseudomonas aeruginosa* were introduced into the wound defect.

After the animals were divided into four groups of five rats each, depending on the wound dressing applied. Following a three-day interval, the dressing in the first three groups was replaced with a coating containing growth factors. On the seventh day, the animals were euthanised, and histological material was collected and analysed.

**Result:** The maximum bacterial contamination observed in groups 2 and 3 was 102 colony-forming units (CFU) in 25% and 20% of individuals, respectively. In contrast, the control group exhibited a range of 102 to 105 CFU in all participants.

**Conclusions:** The utilisation of alginate-based dressings resulted in a reduction in the healing time of the wound, accompanied by a more active appearance of granulation tissue, as evidenced by histological examination.

## Current trends and prospects for total elbow arthroplasty

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Introduction: the authors present an analysis of trends and prospects for primary and revision elbow arthroplasty.

Methods: the 1st part (literature review) was carried out on the Internet platforms PubMed, Google Scholar, Science Research Portal, eLibrary, CyberLeninka, rsl.ru. The main directions in research work were determined: indications for endoprosthetics of the elbow joint, implant design, complications and revision surgery. The 2nd part of the study includes our own clinical observations (106 clinical cases of total primary and revision arthroplasty of the elbow joint in various groups).

Results: the problem of elbow arthroplasty remains relevant for modern traumatology and orthopedics due to the large number of complications and unsatisfactory results of both primary and revision arthroplasty. Based on the analysis of the literature and our own clinical observations, the following conclusions were drawn: the rejection of fully connected, rigid systems due to the high frequency of aseptic loosening, the need for further research in the direction of implant design, improvement of the operation technique, determination of strict indications for elbow arthroplasty depending on the pathology, age of the patient and his physical activity, determination of indications for the use of various types of endoprostheses depending on nosology, improvement of technology and development of new methods of revision arthroplasty of the elbow joint.

## Outcomes of day case shoulder replacement surgery in a stand-alone day care unit in the United Kingdom

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**Background:** This review aims to compare the outcomes for day case shoulder replacement with in-patient shoulder replacement surgery in a district general hospital. **Methods:** Seventy-three patients had 82 shoulder arthroplasty procedures. Forty-six procedures were undertaken in a dedicated stand-alone day-case unit and 36 were undertaken as in-patient cases. Patient were followed up at 6 weeks, 6 months and annually. **Results:** There was no significant difference between the outcomes of shoulder arthroplasty procedures performed in the day case or in-patient settings making this a safe option for surgical care in a unit with an appropriate care pathway. Six complications in total were observed, three in each group. Operation time was statistically shorter for day cases by 25.1 min (95% CI - 36.5 to -13.7;  $d = -0.95$ , 95% CI -1.42 to 0.48). Estimated marginal means (EMM) revealed lower post-surgery oxford pain scores in day cases (EMM = 3.25, 95% CI 2.35, 4.16) compared with inpatients (EMM = 4.65, 95% CI 3.64 to 5.67). Constant shoulder scores were higher in day cases versus inpatients. **Conclusion:** Day case shoulder replacement is safe with comparable outcomes to routine inpatient care for patients up to ASA 3 classification with high satisfaction and excellent functional outcomes.

## Enhancing Functionality In Rheumatoid Arthritis: A Case Report And Discussion Of Total Elbow Arthroplasty

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**Introduction:** Total Elbow Arthroplasty (TEA) is now a widely adopted, motion-preserving intervention for treating diverse debilitating elbow conditions. **Case Presentation:** A 77-year-old male, diagnosed with rheumatoid arthritis impacting the right elbow, presented with a significantly restricted range of motion (60-40°), resulting in limitations in daily activities such as feeding and personal hygiene. X-rays revealed severe ulnohumeral space narrowing with periarticular erosions and prominent osteophytes, classified as Larsen Grade 5. He was recommended for treatment with a total elbow arthroplasty utilizing a Coonrad-Moorey design. We employed a Bryan-Morrey approach, carefully identifying and protecting the ulnar nerve during the procedure. Postoperatively, he received instructions to initiate controlled mobilization immediately. At 10 weeks post-surgery, he was pain-free with an improved elbow range of motion (110-55°) which facilitated daily tasks like shaving and feeding, markedly reducing preoperative difficulties. **Discussion:** Rheumatoid arthritis stands as the predominant inflammatory arthropathy in adults, with 10-20% of these patients having arthritic changes in the elbow. The optimal candidate for TEA is typically aged over 65, a patient with low demands, and capable of adhering to post-operative weight-bearing restrictions. The semi-constrained Coonrad-Moorey design is favored for its allowance of varus-valgus and rotational laxity, thereby diminishing stress on the bone-cement interface and reducing the likelihood of component loosening. Our approach includes a humeral implant featuring an anterior flange to mitigate stress shielding and potential early humeral loosening. In the context of rheumatoid arthritis, TEA demonstrates excellent outcomes, boasting a 90% rate of survivorship without revision at the 10-year mark.



## Association Between Rotator Cuff Failure and Mid-Term Survival in Primary Stemless Anatomic TSAs with the Sidus Stem-Free Shoulder System: A Single-Centre Study

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**Introduction:** The primary aim of this study was to evaluate mid-term survival of primary stemless anatomic TSAs performed between 2015 and 2021, using Sidus Stemless Shoulder System. The secondary aim was to review clinical and radiologic outcomes and investigate the association between rotator cuff failure and mid-term survival. **Methods:** A prospectively collected database of 85 patients was reviewed retrospectively. Survival analysis was undertaken using the Kaplan-Meier approach. Clinical outcomes at a mean follow up of 4.36 years were evaluated and compared to baseline scores, using the following measures: OSS, CMS, and range of motion. Radiographs were assessed for the Walch classification, component radiolucency, and cuff failure. Statistical analysis involved the paired student t-test, Mann-Whitney U test and the Kruskal-Wallis test. **Results:** Indications for surgery were mainly osteoarthritis (94.1%). The Sidus prosthesis demonstrated a 95.8% survival rate after 5 years, with revision as endpoint. Significant improvements ( $p < 0.001$ ) were observed in all clinical outcome measures at the mean 4.36-year follow-up with OSS improving from 20.68 to 41.20 and CMS from 24.16 to 64.09. Radiographic analysis revealed glenoid and humeral component lucency and superior migration, with the latter significantly predictive of worse outcomes ( $p < 0.05$ ). Notably, rotator cuff failure significantly impacted functional scores and necessitating revision. **Conclusions:** The Sidus prosthesis proves to be a viable option for stemless TSA, exhibiting favourable mid-term survival and clinical outcomes. Our findings underscore the importance of considering rotator cuff integrity in the mid-term survival and clinical outcomes of primary stemless anatomic TSAs.

## Strut bone grafting for uncontained glenoid defect during reverse total shoulder arthroplasty.

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**Introduction:** Severe glenoid bone loss poses a frequent challenge in both primary and revision shoulder arthroplasty procedures. It's imperative to address this issue effectively to mitigate risks such as premature loosening, impingement, notching, and instability. Various techniques exist to manage glenoid bone loss. In this article, we utilize allografts to address such issues. **Methods:** Between 2015 and 2022, 7 RTSA with uncontained glenoid bone defects underwent primary reverse shoulder replacement surgeries. All patients were treated with bone grafts which were securely fastened with screws, including autograft or allograft, except one patient. A pre-operative CT scan was conducted to aid in surgical planning and to determine the glenoid version. The percentage of bony defect was also calculated. We assessed clinical results using the Constant score, American Shoulder and Elbow Surgeons Score and the failure rate was also assessed. **Results:** Between 2015 and 2022, 7 patients underwent glenoid bone grafting during reverse shoulder arthroplasty for uncontained glenoid defect. Average age was 73 years old. The indications for surgery were cuff arthropathy and infection. The CT scan revealed that three patients had a glenoid defect exceeding 50 percent. There were a statistically significant difference in the ASES and the Constant scores among the patients. Only one patient experienced loosening, and in that case, the bone graft was not secured with screws. **Conclusion:** Bone grafting offers a reliable and effective approach for addressing uncontained glenoid bone loss even the bone defect more than 50%. This method consistently delivers favorable clinical and radiological outcomes.

## Change in clinical practice of reverse shoulder arthroplasty (RSA) following introduction of Three -Dimensional Computerised Tomographic (3D - CT) planning.

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### Purpose:

The purpose of this study is to assess the change in practice regarding reverse shoulder arthroplasty (RSA) surgery after we introduced 3D CT planning in the preoperative phase with a validated software for decision making, implant selection, use of patient specific 3 D printed bone model and patient specific guide. Our hypothesis was to assess change in practice for accurate implant prediction with 3 D CT planning.

### Study Design & Methods :

We did a retrospective review of patients undergoing shoulder arthroplasty before and after introduction of preoperative 3D CT planning software for assessment regarding glenoid version, deformity, bone loss which were compared for consistency and reliability during surgery. Our data shows that after introduction of 3 D CT planning almost 50% of the shoulders required patient specific bone model, guide and augment for glenoid. This has enabled surgeon to achieve better base plate contact with the native Glenoid with out excessive reaming there by potentially improving the long term outcome.

### Conclusion:

We have noted massive change in practice after introducing pre-operative 3-D templating for shoulder arthroplasties which accurately predicts the version, inclination and size of the glenoid. The use of bone model and the Patient specific Instrumentation (PSI) would enable to correct inclination and version and depth of reaming to the desired level. 3D CT planning could potentially reduce factors that lead to failure of shoulder arthroplasty such as glenoid loosening caused by both humeral and glenoid component malpositioning. Our study recommends routine 3 D CT pre-operative planning.

## Functional improvement after augmented teres major tendon transfer for the treatment of scapula alata

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Scapula Alata is a condition with a notable deformity of the scapular belt which can lead to pain and shoulder dysability. Tendon transfer could be an option to improve shoulder stability and function. We report the case of a 40-year-old patient who presented with severe shoulder girdle deformity and a significant daily activity-limiting pain. After thorough clinical and radiological evaluation, the patient was deemed eligible for surgical intervention. Tendon transfer (teres major tendon augmented with semitendinosus) was performed to correct the position of the scapula and restore the shoulder function. Surgery was followed by a rehabilitation protocol. At six months follow up, a significantly improvement in scapular stability and shoulder mobility was noted. Pain has considerably decreased. Clinical observation of Scapula Alata associated with painful and dysfunctional shoulder should prompt investigation for involvement of the long thoracic nerve. Accurate and meticulous clinical examination, along with electromyography performed by an experienced operator, confirm the diagnosis, assess prognosis, and rule out other sources of scapular dyskinesis. The diagnostic contribution of MRI of the scapular region still needs to be evaluated but appears promising. Tendon transfer of the teres major and semitendinosus is an effective option to improve the quality of life of patients suffering from this condition

## An Observational study of Functional Outcomes following surgical repair of Distal biceps tendon tear – using suture anchors through Single Incision approach, in a consecutive case series

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### Introduction:

As distal biceps tendon tear is an uncommon entity with a very low incidence rate 1.2 of 100000 injuries, this study has been undertaken to assess the functional outcome and complications of those who were surgically managed by using suture anchors through a single incision approach.

### Material & Methods:

A retrospective prospective study was performed of patients who were operated for distal biceps tendon tear using two suture anchors by same surgeon, between May 2015 & May 2022. A total of 37 patients were included in the study, categorised into acute, subacute & chronic tear. Subjective assessment was done using Q-DASH & MAYO elbow score. Furthermore, complications were noted and its impact on functional outcome was assessed.

### Results:

A total of 37 patients were operated in the study period. All patients were men and dominant limb involved in 23 patients. 26 of the 37 patients were treated at less than 6 weeks from injury and rest 11 patients underwent surgical repair after 6 weeks. Graft for reconstruction used in 8 patients.

Average Q-Dash score was 5.2 and Mayo's Elbow performance score was 94.41. Among complications -transient neuropraxia of forearm cutaneous nerve noted in 6 patients, stiffness in 4 and posterior interosseal nerve neuropraxia noted in 1. No significant complications like re-rupture/re-surgery, infections or long-term function disability were seen.

### Conclusion:

Surgical repair of distal biceps tendon injury through a single incision approach and fixation using two suture anchors is an effective surgical procedure with good functional long term results.

## Comparative analysis of bone mineral density of the lumbar spine, hip, and proximal humerus in patients with unilateral rotator cuff tear

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**Background:** The proximal humerus is a common osteoporotic fracture site; however, it has been overlooked. This study aimed to determine the usefulness of measuring the BMD of the proximal humerus by measuring the conventional BMD and bilateral proximal humeri BMD in patients with unilateral RCT.

**Methods:** From April to September 2020, 87 patients who underwent arthroscopic repairs for unilateral RCTs were examined for age, body mass index, menopause duration, passive ROM, global fatty degeneration index, and RCT and retraction size. The conventional BMD and proximal humerus BMD were measured preoperatively using dual-energy X-ray absorptiometry. The regions of interest (ROIs) for the conventional BMD, lumbar spine, femur neck, femur trochanter, and femur total were used, and the ROIs for the proximal humerus, head, lesser tuberosity, greater tuberosity, and total were used. The conventional ROI, asymptomatic-side ROI, and RCT-side ROI of the proximal humerus were analyzed statistically.

**Results:** There was no correlation between the conventional BMD and each proximal humerus BMD (all  $p > 0.05$ ). All ROI BMD of the RCT-side proximal humerus was not significant in the multiple regression analysis with age, onset, body mass index, passive range of motion, global fatty degeneration index, and RCT and retraction size ( $p > 0.05$ ).

**Conclusion:** The proximal humerus BMD shows a completely different trend from that of conventional BMD and has no significance with clinical features. Therefore, the proximal humerus BMD needs to be measured separately from the conventional BMD, as it may provide important information before rotator cuff repair surgery.

## Giant lipomas of the arm in proximity to the radial nerve: three cases report

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**Introduction:**Lipomas are the most common benign mesenchymal tumor and are most commonly located subcutaneously but can occur in any tissue planes. Giant lipomas involving the upper extremities are rare and to be referred as “giant”, it should be at least 10 cm in diameter or weigh a minimum of 1000g.**Materials and methods:**We report three patients who complained of discomfort, paresthesias and a mass in the arm for several years. On clinical examination, there was a soft mass of 11cm x 10, 15x3,4 and 12x6,6cm in each patient over the posterolateral aspect of the arm, not involving the skin. The MRI revealed a lobulated deep lipoma in the posterior compartment of the arm, displacing muscular elements.**Results:**Patients were planned for excision of the lipoma and a straight postero-lateral approach was used to reach the mass. No neurovascular structure was involved but the radial nerve was in close proximity to the masses, so great care was taken intraoperatively to asses the relationship between the mass and this nerve. The masses were removed by dissection and sent for histopathological analysis which confirmed lipomas with no atypical features on microscopy. **Conclusions:**Giant lipomas of the upper extremities are rare and slow growing lesions. The definitive diagnosis of a lipoma can only be made histologically, but MRI remains the imaging modality of choice for their diagnosis. Resection is associated with cure in most patients and it is important to be careful with close proximity to major neurovascular bundles.

## Stiff Elbow Range of Motion Correlation with Capsule Disorganization

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**INTRODUCTION:** In this study, we use a semi-quantitative grading system, previously validated in tendinopathies, to grade this disorganization and correlate this with elbow motion loss.

**METHODS:** Twenty-three whole anterior elbow capsules were collected via open elbow release and were stored in 10% formalin. Measurements of each specimen's length, width and thickness were recorded. The medial and lateral portions were oriented at 90 degrees to each other, embedded in paraffin, sectioned and H&E stained. The tissue sections were graded using the modified Movin scale. Range of motion data was collected at three time points: pre-operative, immediately post-operatively and at the final follow-up appointment.

**RESULTS:** Each specimen was assigned a Movin score equal to the average of the medial and lateral scores as there was no significant difference between them (12.9, 13.1,  $p=0.69$ ). All capsules scored either moderately or markedly abnormal. The average thickness (5.2cm) was comparable to previously published work (4.0 cm,  $p=0.47$ ), and this was significantly greater than cadaveric controls (0.6 cm,  $p=0.01$ ). Average follow up was 6.9 months. Patients showed significantly increased extension at both post-operative measurements compared to preoperatively ( $p=0.001$  and  $p=0.00002$ ).

**CONCLUSIONS:** The thickness of our samples is comparable to previously published work and all of our samples are significantly thicker than cadaveric controls. Assessment of joint capsules from contracted elbows with a validated scoring system found that all samples scored either moderately or markedly abnormal. Our data also suggests there is no difference in histological organization between the medial and lateral aspects of the capsule.



## Calcified Shoulder Tendonitis Treated with TESLA Functional Magnetic Stimulation

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**Introduction:** calcified shoulder tendonitis refers to the calcification and tendon degeneration proximally to the rotator cuff insertion. The supraspinatus tendon is the site most frequently affected. **Aim:** to examine the effect of treatment with TESLA Stym FMS (functional magnetic stimulation) magnetic field in patients with different stages of shoulder calcified tendonitis. **Patients and methodology:** a total of 11 patients with different stages (pre-calcific, calcified tendonitis, and post-calcified stage) of calcified shoulder tendonitis were included in the study. Physical examination revealed stiffness with a diminished active range of motion, and radiographic control evidenced supraspinatus calcification deposit. A TESLA Stym FMS device was used, and a circular magnetic coil was positioned over the affected area, producing rapidly alternating magnetic fields. The dosage and frequency of administration was 45Hz with intervals of 3 sec with intensity at 10%. A total of 10 sessions (3/week) were performed, and each session was 20 minutes long. **Results:** a significant improvement in symptoms (pain, range of motion) was observed upon treatment completion. Radiographic findings after treatment showed no evidence of calcification in the treated areas. **Conclusions:** FMS is a valid alternative treatment for calcified shoulder tendonitis that alleviates symptoms and enhances the resolution of calcification.

## Chronic Sternoclavicular Instability – A rare entity, how to treat it?

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**Aim:** To describe a case of chronic sternoclavicular instability (SC) and its surgical treatment

**Methods:** F, 17 years old, presents to clinic with 2 years of SC pain after an atraumatic episode with shoulder abduction. Worsening of complaints with episodes of anterior dislocation with abduction >90° and reduction with adduction. An x-ray was performed which demonstrated dislocation of the EC in abduction, excluding an epiphysiolysis fracture of the medial clavicle. Due to pain complaints and chronic instability, she underwent surgery: anterior approach, identification SC joint, removal of the meniscus and osteotomy of the distal end of the clavicle and sternum, graft of gracilis, transosseous tunnels and figure-8 reconstruction.

**Results:** D1 hospitalization, with immobilization for 6 weeks. Rehabilitation began after, with avoidance of internal rotation and crossbody movements until 3 months. She is currently 2 months post-operatively, with provisional results.

**Conclusion:** The SC joint is inherently unstable, being dependent on ligamentous and capsular support. Most dislocations are associated with high-energy trauma. Atraumatic dislocation and chronic instability are rare injuries, often associated with hyperlaxity. Surgical stabilization using a tendon graft is described in the literature, with various grafts and various techniques. Figure 8 reconstruction is associated with good outcomes and resistance similar to native EC. Due to the rarity of the pathology and the lack of large-volume studies, the best surgical treatment has not been defined. This clinical case demonstrates the success of reconstruction with gracilis figure-of-8 technique.

## Ilizarov frame in forearm

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**Introduction:** The Ilizarov method has established itself as a powerful technology for the management of a great variety of bone deformity and conditions. It is considered by us as a system that is based on biological laws and technological philosophy. **Materials & Methods:** Between 1990 and 2023, more than 250 of different, difficult and interesting upper limb cases like compound fractures, non-unions, Diaphyseal aclasis, cubitus varus, cubitus valgus, congenital and acquired anomalies, upper limb lengthening, etc. were treated using the Ilizarov technique. **Results:** The Ilizarov method has been shown to be an effective method of treating all kinds of upper limb congenital and acquired deformities, complex open fractures, nonunion, malunion, and cases with extensive soft tissue injury. **Conclusion:** The Ilizarov frame represents a valuable tool in the management of forearm deformities, fractures, offering unique advantages over traditional fixation methods.

**Keywords:** Ilizarov frame, forearm fractures, fracture fixation, limb reconstruction, external fixation

## Habitual dislocation of Sternoclavicular joint- A case report and literature of review.

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Habitual dislocation of the Sternoclavicular joint (SCJ) is rare and often less noticed. We report a case of habitual dislocation of the SCJ in a 22-year-old female who had noticed this abnormal movement of the joint for the last 5 years and was asymptomatic. Medical consultation was sought for the abnormal swelling on one side of the chest. Literature analysis showed fewer case reports. Cosmetic concerns and the later chance of developing osteoarthritis are to be considered. Consensus on management is not well delineated. Surgical treatment offers promising results.

## Proximal ulna stress fracture in a factory worker

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Introduction: Stress fractures of the ulna are rare and are mainly described in sports activities.

Clinical case: We present a 45-year-old female factory worker who presented with hand and wrist paresthesias and intense pain throughout the left elbow, particularly intense on the lateral epicondyle. Conservative treatment with physiotherapy and analgesia was prescribed. Five months later, the clinical presentation was similar. Phalen, Durkan, and Tinel tests were negative, with tenderness on palpation of the epicondyles and the anterior aspect of the forearm, worsened by flexion with supination and resisted finger flexion. Ultrasound was normal. After 8 months and worsening complaints with physiotherapy, an MRI revealed epicondylitis, epitrochleitis, and a stress fracture of the proximal ulna. Brachial suspension was instituted for 4 weeks along with activity restriction. Results: Nine months after the onset, there was resolution of symptoms with resisted pronation-supination and flexion, but complaints of epicondylitis, epitrochleitis, and paresthesias with finger flexion persisted. A CT scan at 9 months showed no evidence of fracture. Discussion: Stress fracture of the proximal ulna in a non-sporting context is not described in the literature. In cases described in a sporting context X-rays may be normal, requiring Computed Tomography or Magnetic Resonance Imaging for diagnosis. Repetitive pronation-supination movements may have been one of the etiological factors, exacerbated by physiotherapy. Conclusion: This is the first reported case of stress fracture of the ulna in a work-related context. Similar to athletes, this condition can be conservatively treated with activity restriction and temporary immobilization.

## Neglected elbow dislocations : About 16 cases

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### INTRODUCTION:

Neglected elbow dislocation is not uncommon in our context, where reliance on traditional treatments is frequent. Managing these injuries is delicate. It poses a real therapeutic challenge for orthopedic surgeons.

### METHODS:

Our retrospective study covers 16 cases of neglected elbow dislocations managed between 2009 and 2018. The average age of our patients was 35 years, with a male predominance. The right side was more affected. The average consultation delay was 3 months. 75% of our patients had initially been manipulated by a traditional healer.

### RESULTS:

With an average follow-up of 25 months, functional outcomes were assessed using the MEPS score. We obtained very satisfactory results in 67% of operated cases, and acceptable results in 26% of cases. The range of motion increased from an average of 14.86 preoperatively to 64.68, while the Mayo score increased from an average of 29.37 to 78.75.

### DISCUSSION:

Chronic elbow dislocations are common in developing countries. Patients first seek treatment from traditional healers "jebbar". For a long time, authors opposed surgical treatment. However, after numerous series in the literature reporting good results with surgical reduction, surgical treatment seems to be favored by surgeons. The decision for surgery depends on the tolerance of elbow stiffness and the duration of dislocation.

### CONCLUSION:

The prognosis for these severe injuries remains guarded, and several technical procedures exist for their treatment. Ligament reconstruction and stabilization techniques, as reported in the literature, yield better results by allowing early mobilization, the only means to combat elbow stiffness.

## A rare case of bilateral antero-internal shoulder dislocation: a case study and review of the literature

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### Introduction:

Although anterior dislocations of the glenohumeral joint are the most frequent type of dislocation, bilateral forms are very rare dominated by the posterior variant. We report a new case of bilateral anterior dislocation of the glenohumeral joints and discuss the mechanism and treatment.

### Case study :

This concerns a 55-year-old patient, who presented to the emergency room with closed trauma to both shoulders in undetermined circumstances. The patient reported a disturbance of consciousness followed by a post-critical coma and generalized tonic-clonic seizures according to witnesses. Clinical examination revealed total functional impotence of the upper limbs, with the following findings: filling of the delto-pectoral groove, bilateral external axe strike, oedema of both shoulders. X-rays of both shoulders revealed bilateral anterior glenohumeral dislocation, with a nondisplaced fracture of the left great tuberosity.

### Discussion:

Bilateral shoulder dislocation is a rare occurrence typically associated with specific etiologies such as epileptic seizures, electrical or neuromuscular disorders, or traumatic events. This report presents a case of bilateral shoulder dislocation in a patient with no history of ligament hyperlaxity, categorized under Brown's classification as traumatic origin. Despite the rarity of this presentation, similar unusual mechanisms of shoulder dislocation have been reported in the literature, including cases where each shoulder dislocated due to different mechanisms

## Management of Comminuted Displaced Neers Type II Lateral End Clavicle Fracture with Coracoclavicular Disruption Using Precontoured Lateral Clavicle Plate and Dog Bone Button

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Introduction: Lateral clavicle fractures account for nearly a quarter of all clavicle fractures. The Type II B fractures (Neer's classification), being unstable, are the most challenging to treat, due to vertical and horizontal deforming forces. Osteosynthesis in distal clavicular fractures can be technically challenging due to variable and inadequate bone stock of the distal fragment, which precludes a stable fixation to enable early mobilization. Non-Union rates are as high as 30%. In such unstable injuries, fixation of the fracture alone neutralizes the horizontal deforming forces and not the vertical, thus increasing the chance of a plate pull out. Case Report: We describe a case with a Type IIB fracture associated with a floating shoulder injury ( undisplaced scapula) which was managed with a pre-contoured locking plate along with coracoclavicular repair with a Dog Bone button and fibre wire. The scapular fracture was managed conservatively. ROM was initiated at 3 weeks. He gained full range of shoulder movement at 6 weeks and complete clinical, pain-free recovery and radiological union at 3 months. Conclusion: Coracoclavicular stabilization with Dog Bone button and fibre wire and lateral end clavicle fracture fixation with pre-contoured plate is an effective method for a good functional outcome as it neutralizes both horizontal and vertical deforming forces, thereby reducing complications, such as non-union, shoulder stiffness, loss of shoulder strength and persistent pain.



## Four cases of scapular and clavicular internal fixation for floating shoulder

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**Introduction:** Floating shoulder is a condition in which the shoulder joint loses support from the trunk due to simultaneous fractures of the clavicle and scapula. This condition represents an absolute surgical indication. However, such cases are rarely encountered, thus leading to a lack of definitive consensus regarding on the optimal internal fixation material.

**Subjects:** Four cases exhibiting floating shoulder, spanning the period from 2014 to 2023, underwent surgical intervention. The mean age of the patients was 53.0 years, with all being male sustaining high-energy traumatic events.

**Clinical Outcomes:** The surgery involved positioning the patient in lateral decubitus and accessing the scapula through the modified Judet approach. Following fixation of the scapula body with a calcaneal plate, and then reposition into the beach chair position for internal fixation of the clavicular fracture. Postoperatively, there was notable improvement observed in scapular shortening and angular deformity of the scapular neck. The angular deformity decreased from an average of 71.3 to 47.8 degrees, with a maximum improvement of 39 degrees. Noteworthy all patients exhibited no progression of the fracture site dislocation, and observed restoration of shoulder joint range of motion.

**Discussion:** Floating shoulder represent a markedly unstable condition necessitating surgical intervention. This study opted for the utilization of a calcaneal plate for scapula stabilization. The merits of employing this calcaneal plate lie in its ability to buttress the scapula in a planar fashion, in contrast to a linear orientation typical of conventional straight plates, alongside its inherent thinness rendering it amenable to bending maneuvers.

## fractures of the upper end of the humerus in patients over 70 years of age

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**Objective:** Fractures of the proximal end of the humerus are common in the emergency ward it is 3rd most common fracture >70years old. . Treatment is the subject of much controversy. We conducted a comparative study of orthopaedic and surgical treatment in a series of patients, with evaluation of radio-clinical results.

**Materials and methods:** This was a retrospective study from January 2022 to September 2023. Two groups were set up: patients who had undergone surgical treatment following a fracture of the proximal end of the humerus, comprising 35 patients, and others who had undergone orthopaedic treatment, comprising patients. The fracture was assessed according to the NEER classification. X-rays of the shoulder face and profile were requested in all patients,. Immobilisation was necessary in all patients, followed by functional rehabilitation.

**Results :** We studied the results of patients reviewed at 6 months by clinical and radiological examination to assess shoulder function, evaluate consolidation and look for any complications. The groups were comparable in terms of age, sex and radiological classification. Progression was studied between 3 weeks and 6 months and at 18 months. Clinical and radiological results were also collected.

**Discussion :** Fractures of the upper end of the humerus are very frequent, with very different prognoses and treatments

**Conclusion :** Statistical analysis of functional and radiological results showed no superiority of surgical treatment over orthopaedic treatment. Overall results were influenced by patient age, fracture type, surgical technique, anatomical outcome and the quality of rehabilitation.

## Elbow coronal shear injury- A rare fracture triad of capitellum , olecranon and lateral condyle humerus

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**Introduction:** Coronal shear fractures around elbow are challenging subset of fractures. Capitellum is the most commonly fractured bone in these injuries. However a fracture triad involving olecranon, capitellum and lateral condyle is a rare fracture combination and dealing them all together with a single approach is difficult. **Case Report:** An elderly lady presented with fall on flexed elbow. Radiographs revealed a rare elbow fracture triad. Through a standard posterior elbow approach , fracture window of olecranon was utilised to approach the distal humerus. A second fracture window involving the lateral condyle was utilised to indirectly reduce the capitellum. Fluoroscopy guided postero-anterior herbert screws was used to fix the capitellum. Lateral condyle fixation was done with cancellous screws followed by an olecranon tension band wiring. Gentle elbow range of motion exercises was allowed from third post-operative day. Complete bony union was achieved by third month with excellent functional outcome. **Conclusion:** An unusual fracture pattern with dual fracture open window technique with a single incision approach can deal with all these three fractures and yield good results.

## The Outcome of Primary Total Elbow Arthroplasty for Acute Distal Humerus Fracture at Mid Term Follow-up

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**Introduction:** This study evaluated the mid-term outcomes of primary total elbow arthroplasty (TEA) for acute distal humerus fractures. **Methods:** We reviewed 25 patients who underwent primary TEA for acute distal humerus fractures. A total of 13 patients were included and the mean follow-up period was 6.5 years. At the last follow-up, we measured the degree of pain relief, ROM, and functional outcome. Functional outcome was assessed using the Mayo Elbow Performance Score (MEPS) and Disabilities of Arm, Shoulder and Hand score (DASH score), pain VAS and grip power. Radiological evaluation was performed using elbow anterior to posterior and lateral views to assess implant complications. **Results:** Primary TEA provided satisfactory pain relief and functional improvement in most patients, with a mean MEPS of 82.3 and DASH score of 33.5. Mean VAS for pain of 2.1 at the last follow-up. The mean flexion was 130 degrees and mean ROM was 16.5 to 130 degrees. In terms of grip strengths, patients showed greater strength in their dominant hand regardless of the surgical site. However, the overall complication rate was 69.2% (9 of 13 patients). The most common complication was bushing wear, followed by loosening. **Conclusions:** Primary total elbow arthroplasty can be a favorable option for patients with distal humerus fractures for whom ORIF is not feasible. Our study demonstrated that the majority of patients experienced pain relief and improvement in functional outcomes in the mid-term. However, despite relatively good functional outcomes in the mid-term, the overall complication rate remains high.

## Management of non union of olecranon osteotomy : an approach inspired by Matti-Russe technique

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**Introduction:** Non union is a rare but debilitating complication of olecranon osteotomies. The challenge lies in achieving bone union in this area subjected to significant mechanical stresses. The Matti-Russe technique is effective in treating scaphoid non union, offering an intriguing approach to addressing this challenge. The aim of this work is to present a novel approach inspired by this technique for addressing non union after olecranon osteotomy. **Observation:** We present a technique for treating non union following an olecranon osteotomy in a 32-year-old female patient with history of rheumatoid arthritis, inspired by the Matti-Russe method, combining bone grafting and osteosynthesis. The osteotomy was carried out during a surgery for a supracondylar and intercondylar fracture of the right elbow. At three months, radiographic assessment confirmed bone healing at the non union site. At six months, significant improvement in elbow mobility was observed, allowing the patient to resume daily activities. After one year, the osteosynthesis material was successfully removed. **Discussion and conclusion:** Articular olecranon osteotomy provides good exposure of distal humeral fracture pattern but is associated with non union risk. Our choice of surgical method draws from the Matti-Russe technique renowned for its effective bone healing. The technique described offers an additional option for orthopedic surgeons even in poor quality bone.

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## Optimizing AC Joint Management: A Case Series on Minimally Invasive Tight Rope with Double Endo Button Fixation

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**Background:** Acromioclavicular (AC) joint dislocation constitutes 40% of shoulder injuries, impacting patients across diverse activities. The Rockwood Staging System guides assessment, prompting exploration of the novel Tight Rope with Double Endo Button Fixation technique to restore AC joint function. **Aim:** This study aims to evaluate the outcomes of the Tight Rope with Double Endo Button Fixation technique in 20 cases of AC joint dislocation, emphasizing its potential advantages over conventional methods. **Methods:** A case series involving 20 AC joint dislocation cases underwent comprehensive evaluation, including follow-ups and radiological assessments. Surgical interventions were performed using the Tight Rope with Double Endo Button Fixation technique. **Results:** The average age was 44.5 years, with a notable prevalence of severe dislocations (Classes V and VI). Surgical interventions demonstrated efficiency, with a brief hospital stay. The innovative technique yielded excellent outcomes, with 90% achieving high Constant and Murley Scores. **Conclusion:** Tight Rope with Double Endo Button Fixation emerges as a promising, minimally invasive strategy for AC joint dislocation, exhibiting potential in minimizing postoperative complications and expediting recovery. The study advocates for individualized interventions and emphasizes the need for further exploration of long-term implications.

## Allograft in the treatment of large Hill-Sachs lesion associated with bilateral anterior glenohumeral dislocation: clinical case and literature review

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**Aim** There are several surgical treatment options for large Hill-Sachs defects The present case clinician reports a bilateral

recurrent anterior glenohumeral dislocation (BRAGD), both treated surgically with the filling of the Hill-Sachs defect with a cadaveric humeral head graft.

**Methods:** Man, 19 years old, with a history of Asperger's disease, presenting with BRAGD In both surgeries, deltopectoral approach with subcutaneous tenotomy scapular, the Hill-Sachs defect was measured, mirror osteotomy of the humeral head of the allograft, filling of the bone defect and fixation with two cannulated headless screws (images of surgery and exams in presentation).

**Results:** In both cases, 2 weeks after the surgeries, the patient presented no relevant pain and no signs of instability. He used brachial suspension in abduction and external rotation for 5 weeks and began rehabilitation protocol at 6 weeks post-surgery.

At 3 months post-operatively, there were no signs of clinical or radiological failure in either case.

**Discussion:**

The literature highlights several procedures in the treatment of large Hill-Sachs lesions, which can be divided into 3 categories: non-anatomical procedures, anatomical and arthroplasty.

Comparing anatomical procedures with the others, the first ones have the advantage to restore the native anatomy of the humeral head, to maintain a joint biomechanically stable without changes to its kinematics and also offering the possibility of a possible future arthroplasty treatment. On the other hand, they may be associated with the transmission of diseases, pseudarthrosis or allograft resorption. No long-term studies are available.

## Estimation Of the Optimal Fibular Graft Angle for Proximal Humerus Fractures Using finite Element Analysis

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Proximal humerus fracture is a common injury that can be observed in the elderly. Using only a locking plate to treat osteoporotic fractures has shown biomechanical benefits. However, many clinical studies have shown frequent reduction loss and occurrence of varus deformity. To find the most effective angle for fibular-allograft (FA), in this research, FA was placed at multiple angles and the stresses on fibula and plate were measured when axial and shear stresses were applied at the humeral head through simulations. The finite element analysis (FEA) was performed using ANSYS Workbench 19.2 (FEA, ANSYS Inc., U.S.). This study aimed to compare the integral stability, stress performance, and stability of the fracture region when using four fibular insertion angles within the immediate postoperative period.

In conclusion, this finite element study proved the biomechanical advantage of inserting an FA at a certain angle in proximal humerus fracture without medial support. The graft inserted horizontally showed high stability and humeral head fixation under axial and shear loads and the plate stress was lowered overall and widely distributed.



## Neglected Concomitant Posterior cruciate ligament(PCL) injury in femoral shaft fracture

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**Purpose:** Delayed diagnosis and inadequate treatment of PCL injury exacerbates osteoarthritis progression and affects poor prognosis. The purpose of the study is evaluating the prevalence and risk factors of ipsilateral PCL injury associated with femur shaft fractures. **Methods:** 294 femur fractures diagnosed by single center, Wonkwang University Hospital were included in this study from January 2011 to December 2021 with retrospective study. Exclusion criteria were patients with atypical fractures, pathologic fractures, and periprosthetic fractures. So, 33 patients were excluded, finally 261 patients were involved. The fracture site, injury mechanisms, AO/OTA classification were evaluated for assessment of risk factors for PCL injury combined with femoral shaft fractures. There were 17 cases of PCL injury, 15 cases underwent PCL reconstruction, 2 cases received conservative treatment. When the 17 cases were classified into AO/OTA classification, 2 of 32-A2, 11 of 32-A3, 2 of 32-B3, 1 of 32-C2, 1 of 32-C3. **Results:** Average time of diagnosis of PCL injury after surgical treatment of femoral fracture was about 15.6 weeks. Incidence for PCL injury was 8.02%(15/187) with motor vehicle accident, 2.94%(2/68) with slip down. In fracture type, incidence with transverse type was 12.96%(14/108), spiral or oblique type was 1.56% (2/128), and complex type was 4%(1/25). So, transverse type fractures and high energy trauma with traffic accidents were risk factors for concomitant PCL injury in femoral shaft fractures. **Conclusion:** When the patient come with femoral shaft fractures, especially transverse type fracture or high energy trauma with motor vehicle accident, ipsilateral PCL injury should be evaluated.

## Risk factors and surgical treatment of craniovertebral stenosis in patients with Maroteaux-Lamy syndrome (mucopolysaccharidosis type VI)

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### Introduction

Atlantoaxial instability with the outcome of myelopathy and tetraparesis are commonly described in patients with MPS VI type. The accumulation of glycosaminoglycans behind the odontoid process leads to a gradual development of the spinal canal stenosis and compression of the spinal cord/

### Methods

Nine patients with MPS type VI. Of them 3 males and 6 females aged 14 to 35 years (mean age 20.8 years). All patients presented with craniovertebral stenosis of some degree and underwent posterior spinal canal decompression with cervical fusion. Neurological symptoms were observed in 7 of all cases preoperatively. Functional assessment and evaluation of neurological status was conducted in all cases. CT and MRI evaluation was performed at the atlantoaxial level before surgery and at follow-up.

### Results

The average follow-up period was 2.9 years. Seven of the nine patients demonstrated regression of neurological symptoms. In two patients the neurological status was unchanged. Solid fusion was achieved in 6 cases. Complications from surgery we observed in 3 patients. One patient died one year after surgery due to unrelated causes, there was one case of pseudarthrosis one case of implant instability and one case of early postoperative wound suppuration.

### Conclusion

The majority of patients with type VI MPS present with some degree of spinal stenosis at the atlantoaxial level. Based on our experience, these patients require close neurological and radiographic monitoring as early as possible. In our view, surgical treatment of patients with type VI MPS should be considered before the onset and progression of neurological symptoms.

## Surgical treatment of patients with os odontoideum of C2 vertebra

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**Introduction:** Os odontoideum of C2 vertebra (OsO) is a rare pathology of the craniovertebral junction (CVJ). A specific feature of this pathology is the high frequency of atlantoaxial instability and neurologic deficit. There is no unified approach to surgical treatment at the moment.

**Materials and methods:** A retrospective analysis of the results of surgical treatment of 24 patients with OsO in the period from 2005 to 2023 was performed. The study group consisted of patients aged from 3 to 21 years. The mean age was  $11.1 \pm 4.7$  years. Sex distribution: 16 female patients and 8 male patients. The 16 patients had associated genetic syndromes. The OsO was most frequently in children with Down syndrome (37.5% in the total sample and 56.25% in the syndromic group). Signs of neurologic deficit were present in 18 patients. C1-C2 (Harms) fixation and occipitospondylosis were used for stabilization.

**Results:** Surgical treatment of patients with OsO is multistage. The main objectives of surgical treatment are to achieve stable fixation in the CVJ and to eliminate dislocation while achieving decompression of the spinal cord. The degree of spinal cord function restoration after decompression directly depends on the level of the initial neurologic deficit and the increase of the space available for cord coefficient (SAC-C1/SAC-C4). The use of additive technologies can help to solve a number of problems when performing stabilization in pediatric patients with severe dislocations and bony anomalies.

## CT Scan Study : The Iliolumbar Vein

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**Introduction:**The iliolumbar veins are encountered during the anterior approach to the lower lumbar spine. They are characterized by significant anatomical variability and vulnerability which can lead to massive and potentially fatal intraoperative bleeding. To avoid these complications, a thorough knowledge of vascular anatomy is essential, hence the interest of our study which aims to investigate the anatomical characteristics of the iliolumbar vein. **Materials and Methods:**This is a descriptive study involving 50 abdominal angioscans collected from the radiology department. **Results:**Our study included 50 patients. The level of aortic bifurcation was located at L4 in 44% of cases, L3-L4 in 28% of cases, and L4-L5 in 22% of cases. The level of ilio caval confluence was located at L4-L5 in 28% of cases and at L5 in 56% of cases. The iliolumbar vein was present in 78% of cases, unilateral in 11% of cases, and bilateral in 67% of cases. The angle between the iliolumbar vein and the left primitive iliac vein averaged 101°. The angle between the two primitive iliac veins averaged 58°. The distance between the termination of the iliolumbar vein and the confluence of the two primitive iliac veins averaged 60mm. The distance between the lateral border of L4-L5 and the edge of the ilio caval vein averaged 26mm. **Discussion and Conclusion:**The iliolumbar vein is encountered during the anterior approach to the lumbar spine. It is characterized by significant presentation variability and the lack of studies on a complete anatomical description. Knowledge of the morphometric parameters of this vein is vital for determining surgical approach, risk of avulsion and for identifying it for ligation during the exposure phase.

## Atlanto-axial dislocation masquerading as acute inflammatory demyelinating polyneuropathy in a 6-year-old: A case report

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Case: We present a case of 6-year-old male child with acute-onset progressive quadriparesis (ASIA score B), a weak gag reflex, and respiratory distress, for which endotracheal intubation was performed in the emergency room. The patient had a similar history of acute motor axonal neuropathy (AMAN) variant of Guillain-Barre syndrome 5 years ago which was successfully managed with intravenous immunoglobulin. The current episode was thought to be a recurrence and hence intravenous immunoglobulin was given. As the patient had no improvement, he was started on high-dose injectable methylprednisolone. The patient achieved gradual restoration of functional power and an ASIA score of D, but spontaneous respiratory efforts did not return, which raised the suspicion of an alternate pathology. On further investigations, congenital atlantoaxial dislocation with type 2 basilar invagination and aberrant left vertebral artery course over the C2 lamina was identified. A hyperintense signal was seen within the cord on T2-Weighted Imaging. This scenario of acute onset neurological deficit in a patient of congenital AAD was managed with posterior decompression and occipito-cervical fusion with plating. Postoperatively patient improved to ASIA score of E and was successfully weaned off the ventilator over 2 weeks. Conclusion - Congenital AAD has multiple presentations and may present with acute onset of neurological deficit without significant trauma mimicking acute inflammatory demyelinating polyneuropathy, as highlighted in our case. It is imperative to make a correct and timely diagnosis for a favorable outcome.

## Clinical, functional and radiological outcomes of one-stage posterior-only hemivertebra resection, deformity correction and short segment fusion for congenital kyphoscoliosis.

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**Introduction:** Congenital kyphoscoliosis due to fully segmented or semi-segmented hemivertebrae is a progressive deformity that requires surgical correction and fusion by resection of hemivertebrae to prevent progression to severe deformities and its ensuing complications. We analyzed the outcomes of hemivertebra resection and instrumented deformity correction through a single-stage posterior only approach for congenital kyphoscoliosis. **Methods:** Eleven patients (8 males, 3 females) with fully segmented or semi-segmented hemivertebrae with congenital kyphoscoliosis were treated with hemivertebra resection, instrumented deformity correction and short segment fusion through a single-stage, posterior-only approach. Operative time, intraoperative blood loss, magnitude of deformity correction, functional outcomes (SRS-22r scores) and postoperative complications were recorded. **Results:** The mean follow-up was 27.3+/-2.6 months. The mean operative time and intraoperative blood loss were 262.8+/-64.3min, (range 180 – 380 min) and 390.8+/- 144.2 ml, (range 250 – 600 ml) respectively. The mean segmental scoliosis and kyphosis correction rates were 76.2% and 71.3% respectively. There was a significant improvement in the global sagittal and coronal alignment which was maintained till the last follow-up. The SRS-22r scores showed a significant improvement [pre-op (2.3+/-0.5) vs final follow-up (4.1+/-0.6)]. There was one case of superficial wound infection and one case of neurological deficit. **Conclusion:** Hemivertebra resection, deformity correction and short segment fusion through one-stage posterior-only approach offers good functional and radiological outcomes with minimal complications at a mean follow-up of 27.3+/-2.6 months. However, a longer follow-up will enable a better understanding of the long term outcomes of this procedure.

## How to wean braces? A randomized controlled trial to assess gradual or immediate brace weaning

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This was an open-label randomized controlled trial of patients undergoing underarm bracing and were advised for brace weaning. They were randomly allocated into two groups: gradual weaning (nocturnal brace-wear for 6 months), and immediate weaning. Radiographic assessment included major and minor curve Cobb angles, truncal and sagittal balance. HRQoL was assessed using SRS-22r questionnaire and EQ-5D-5L at post-weaning 6-months, 1-year and 2-years. A total of 306 patients were recruited: 151 with gradual weaning and 155 with immediate weaning. There were no intergroup differences of patient demographics at baseline ( $p>0.05$ ), including weaning major Cobb angle ( $30.4^{\circ}\pm 8.3^{\circ}$  vs  $29.1^{\circ}\pm 8.6^{\circ}$ ). Curve progression/static/regression were not associated with the weaning protocols ( $\chi^2=2.114$ ,  $p=0.347$ ) at post-weaning 2-years. At post-weaning 2-years, there were no significant difference between immediate and gradual weaning for change of truncal shift (2.6 vs 2.4mm,  $p=0.897$ ), change of C7-CSVL deviation (2.3 vs 1.7mm,  $p=0.695$ ), change of SVA deviation (-2.4 vs 0.9mm,  $p=0.305$ ). There were minimal differences of changes of SRS-22r total score (0.22 (95%CI:0.15-0.30) vs 0.27 (95%CI:0.18-0.37),  $p=0.407$ ), EQ-5D utility score (0.016 (95%CI:0.007-0.024) vs 0.023 (95%CI:0.010-0.036),  $p=0.360$ ) and EQ-VAS (2.1 (95%CI:-0.6-4.7) vs 1.4 (95%CI:-1.2-4.0),  $p=0.730$ ). Gradual weaning appears to have no obvious benefits over immediate weaning in terms of post-weaning curve magnitude and truncal balance maintenance, and HRQoL changes. The similar curve progression, static and curve regression regardless of weaning protocol, provides evidence that we should not rely on continual wearing of the orthosis for maintaining brace outcomes.

## Utilization of the Proximal Femur Maturity Index for Bracing in Adolescent Idiopathic Scoliosis

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The Proximal Femur Maturity Index (PFMI) can be used to assess skeletal maturity on existing whole-spine radiographs without additional radiation. However, the relationship between the PFMI at the initiation of bracing for adolescent idiopathic scoliosis (AIS) and subsequent curve progression remains unknown. This was a prospective study of 202 patients with AIS who were prescribed underarm bracing and had good brace-wear compliance. Patients were followed from brace initiation until complete skeletal maturity. Longitudinal data on the coronal Cobb angle and skeletal maturity assessments using Risser staging, Sanders staging, the distal radius and ulna classification, and the PFMI were collected. Each patient was assessed on whether the major curve progressed to  $\geq 40^\circ$  (adulthood deterioration) and  $\geq 50^\circ$  (the surgical threshold). PFMI correlated with the other skeletal maturity indices ( $r_s=0.60-0.72$ ,  $p<0.001$ ). The pre-brace PFMI grade correlated with progression to  $\geq 40^\circ$  ( $r_{rb}=-0.30$ ,  $p<0.001$ ) and to  $\geq 50^\circ$  ( $r_{rb}=-0.20$ ,  $p=0.005$ ). Based on regression models ( $p<0.001$ ) adjusted for the pre-brace major Cobb angle and curve type, brace initiation at PFMI grades 2 and 3 for a curve of  $\geq 30^\circ$  had predicted risks of 30% (95% CI:4%-55%) and 12% (95% CI:7%-17%), respectively, for progression to the surgical threshold. Brace initiation at PFMI grade 5 had 0% progression risk. Patients with brace initiation at PFMI grade 4 for a curve of  $<30^\circ$  or at grade 5 were unlikely to progress to the adulthood deterioration or surgical threshold. Skeletally immature patients initiating bracing at a PFMI grade of  $\leq 3$  for curve of  $\geq 30^\circ$  had higher risk of progression.



## Long-term results of the use anterior dynamic scoliosis correction (ASC) in patients with complete growth

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**Introduction** Recently, anterior dynamic scoliosis correction (ASC) become a popular method of treating IS. We present the results of the treatment patients with IS and the use ASC during the period of completed and near-completed growth.

**Purpose**

Evaluation of radiological and clinical data on the results of IS surgical treatment in patients with completed or near-completed growth using ASC, FU period more than 2 years.

**Material and methods** A retrospective study of patients who underwent ASC. Demographic data were taken into analysis. X-ray data (Cobb angle before, after surgery and  $\geq 2$  years, Lenke type, Risser, fixation levels, nucleotomy, blood loss, surgery time, complications. The functional result was assessed using the SRS 22. Results Out of 87 pt.: 4 men (4.6%) and 83 female patients (95.4%). ASC (thoracic) was performed in 30 pt., lumbar/thoracolumbar–32 pt., from 2 sides–13, hybrid system in 12 cases. The average blood loss is  $281.2 \pm 173$  ml. the operation time is  $174.8 \pm 42.3$  min. The average FU–2.2 yrs. The average age–23.3. The average Risser test is 4.42 (3-5). The average fixed levels was  $7.25 \pm 1.6$ . The average Cobb angle in the thoracic gp. at the 1st PO study was  $27.9^\circ \pm 5.3^\circ$  last  $25.2^\circ \pm 6.9^\circ$  compared with the preop.  $62.4^\circ \pm 10.9^\circ$ . There was also no significant loss of correction in patients who underwent surgery for lumbar/thoracolumbar scoliosis (before  $52.5^\circ \pm 8.4^\circ$ , after  $24.2^\circ \pm 12.4^\circ$ , long-term FU  $27.2^\circ \pm 11.6^\circ$ ).

**Conclusion** ASC in adults is a new direction in scoliosis surgery and allows to achieve a satisfactory radiological and functional result, which remains under observation for 2 yrs.

## Surgical treatment of idiopathic scoliosis Lenke 1 using various methods. Comparison of the long-term results.

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### Introduction

According to the literature, patients with idiopathic thoracic scoliosis (Lenke 1) can be treated using the method of anterior or posterior fusion, as well as anterior dynamic correction, however, there is insufficient information regarding the comparison of these surgical treatment options.

### Material and methods

A retrospective monocenter non-randomized comparative study was conducted based on the material obtained during the surgical treatment of 79 patients in the period from 2014 to 2021. For statistical analysis, the following indicators: age; the magnitude of the deformation and TK according to Cobb before and 2 years FU; blood loss.

### Results

Of the 79 patients, 72 female and 7 were male. The average age 27 years. The patients were divided into groups according of the surgical intervention: GP1 (anterior scoliosis correction – 23); GP2 (posterior fusion– 35); GP3 (anterior fusion – 21). In GP1, the Cobb angle before surgery was  $53.4 \pm 16.9^\circ$ , at remote observation  $25.9 \pm 10.3^\circ$ . TK before surgery is  $13.1 \pm 12.2^\circ$ , long-term FU  $21.8 \pm 5.9^\circ$ . The preoperative angle of the main arch in GP2 was  $58.4 \pm 12.6$ , long-term FU  $24.6 \pm 9.2^\circ$ . TK before surgery was  $15.6 \pm 7.5^\circ$ , with a long-term observation of  $19.2 \pm 8.5^\circ$ . In GP3, the magnitude of the main arc before surgery was  $48.4 \pm 10.9^\circ$ ,  $19.4 \pm 9.1^\circ$  24 months after  $23.9 \pm 11.3^\circ$ . The average number of fixed levels in GP1 and 3 turned out to be comparable:  $8.4 \pm 1.0$  and  $8.7 \pm 1.5$ .

**Conclusions** Each of the studied methods can provide a stable satisfactory result in terms of radiological and clinical data with an initially similar amount of deformation at the 2-year FU.

## Poor Posture and Its Treatment

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The spine, protecting the spinal cord within its canal and characterized by a considerable number of joints, is incredibly flexible. However, it is occasionally subject to heavy strain and vulnerable to injuries. There are three fundamental types of poor posture. The causes of poor posture can be both internal and external. Physical therapy slows down the worsening of deformities, but due to the development of conditional and then unconditional reflexes in an improper body position, it does not lead to a cure. Orthostatic braces can result in muscle atrophy. The New Simplex method achieves complete healing, regardless of age. It focuses on agonists and antagonists, placing the body in an optimal position from the start, assuming there are no significant structural changes. Over time, conditional reflexes become unconditional, leading to recovery. In structural thoracokyphosis, a slow correction is performed physical therapy and the simplex method. Correction in females: 1. Stand vertically, knees straight, pulled down, scapulae pressed against the thorax pushed backward, 2. When walking, follow point 1 with alternating fully extended knees, 3. While sitting, thorax as in point 1, pull knees back, 4. When lying down, as in point 1 but in a horizontal position. Correction in males is the same, with the knees pulled in the opposite direction. Maintaining good posture is a dynamic process throughout life, requiring conditioning exercises without excessive strain. I intend to demonstrate this method with the help of volunteers in front of the audience.

## Lumbar Intradural Disc Herniations: Literature Review and Our Experience

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Disc herniation of lumbar spine is common but it rarely presents at the intra-dural location. As for any disc herniation, the patient undergoes same clinical and radiologic examination. However, the surgical excision is way more challenging. To remove the intra-dural disc material a formal durotomy is required; that needs to be followed by dura repair. Here we are presenting three of such presentations that were treated and individual outcome has been summarized as well. Thus, spine surgeons need to be prepared for such operative findings and must make sure a watertight sealing of dura following complete excision of pathological disc material.

## The Effect of Posterior Instrumentation Design on Lumbar Lordosis: An Anatomic Evaluation

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**Introduction:** Spinal fusion surgery requires the appropriate balance of spinopelvic parameters for better patient outcomes. Of interest is the restoration of lumbar lordosis (LL) which when compared with pelvic incidence (PI) and sagittal vertical axis (SVA) can be important for patient-specific surgical planning. With a specific amount of lordosis needed to achieve an optimized outcome, the literature has described a mismatch between rod bending contour and LL. This study aims to identify factors contributing to this mismatch. **Methods:** Six Lumbosacral Sawbones models were used with differently contoured rods, polyaxial systems, and reduction sequences. Markers were applied at the endplate of each vertebral body, and orthogonal images were obtained after each instrumentation placement. Using Matlab, the images were processed and the angles between segments and the overall LL angle were calculated. **Results:** A mean LL of  $43.72 \pm 4.43$ ,  $52.38 \pm 4.59$ , and  $57.32 \pm 4.37$  was obtained for the Hypolordotic, Normolordotic, and Hyperlordotic rods, respectively, and all comparisons found to be statistically significant at an alpha level of 0.05. No significant difference was found between the type of polyaxial system used, rod reduction sequence, or segmental lordosis levels. **Conclusions:** The study does not support a specific mechanism for the rod bending contour and LL mismatch, though the differences across the LL achieved by our rod contour groups support the idea of presurgical planning of LL and the use of patient-specific rods. However, further in vivo studies with radiographic endpoints are necessary to investigate this topic.

## Impact of Navigated Radiofrequency Ablation (RFA) on Spinal Tumors

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**Introduction:** Spinal tumors affect 5-10% of cancer patients, causing pain and neurological deficits. While radiation therapy is standard, limitations prompt interest in radiofrequency ablation (RFA) to reduce tumor burden. **Methods:** Retrospective analysis of 247 patients undergoing RFA for spinal tumors (Oct 2013 - Jul 2020). Outcomes included ambulatory status, survival, pain scores, quality of life, and radiological tumor assessment. **Results:** Of 96 patients, 50 died within 15 months post-RFA (average survival: 5.67 months). Survivors experienced significant pain reduction, improved quality of life, and maintained ambulation. Despite a 90% retention rate, 151 patients were lost to follow-up. **Discussion:** RFA yielded improved clinical outcomes without adverse effects like new fractures seen in radiation therapy. Limitations include retrospective nature and incomplete data due to follow-up losses. Future trials should compare RFA with alternative treatments for spinal tumors.

## Pelvic Incidence and Sagittal Balance Changes between Flexion and Extension

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**Introduction:** Historically considered static, pelvic incidence (PI) has been shown in recent studies to undergo changes in various situations, potentially impacting sagittal alignment in patients with fused thoracolumbar fusion. However, the effect of PI change on sagittal vertical axis (SVA) remains unexplored. **Methods:** 106 patients were retrospectively evaluated using pre- and post-operative EOS images to measure PI, pelvic tilt, sacral slope, and lumbar lordosis. Inter-observer reliability and parameter variations were analyzed. **Results:** 12.3% of patients demonstrated PI changes  $\geq 6^\circ$ , exceeding measurement error. Calculations showed mean SVA changes of 7.519 mm, ranging from 3.666 to 19.676 mm. Considering normal sacroiliac joint (SIJ) motion, SVA variation could reach 5.623 cm. **Discussion:** Patients with excessive SIJ motion may experience considerable variability in global sagittal alignment despite proper thoracolumbar correction. PI is a dynamic parameter that may significantly affect global sagittal alignment, emphasizing the importance of considering PI during surgical planning and surgery.

## Charcote Spine Arthropathy - posterior spondylodesis with anterior support as treatment of choice – a case report

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Charcot Spinal arthropathy (CSA) is rare disorder that occurs after spinal cord transection, characterized by loss of innervation including deep pain and proprioception distal to the level of injury. Nowadays, the most common cause of CSA is SCI (spinal cord injury) caused by traffic accidents, falls from height or gunshot wounds. CSA is presented with gross instability due to vertebral joint degeneration and imaging method for confirmation of CSA is MSCT (multisliced computer tomography). The treatment of choice, if no contraindications is 360° spondylodesis. We present a case of 53 year old female who suffered gunshot trauma to spinal cord in 2002 at the level Th9/10 which resulted in paraplegia (ASIA-A). After ten years patient came with gross scoliosis, in April 2012 we proceeded with posterior spondylodesis with transpedicular fusion at level Th10-L4 and correct scoliosis. She was admitted to our ward in February 2021 for further neuroimaging because of the worsening pain in last two years. We did the MSCT and found hardware loss with osteous apositions at the level Th12/L1 and L4/L5. After the preoperative preparation and signed consents, we removed the hardware and the patient was discharged. After 18 months she suffered gross deformity with low ribs in contact with the anterior iliac crest. We decided to perform posterior spondylodesis on levels Th10 to iliac bone with anterior support. Postoperatively, the pain diminished and the deformity was partially corrected. We consider that the treatment of choice for CSA should be posterior spondylodesis with the anterior support.



## Occult ossified ligamentum flavum as a rare cause of myelopathy associated with a neglected congenital lumbar scoliosis

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**Introduction:** Ossified ligamentum flavum (OLF), in association with a congenital spinal deformity has been rare presentation **Methods:** We describe a 31-year-old male patient with a neglected congenital lumbar scoliosis with back pain, gait unsteadiness and neurological deficit, who was planned for deformity correction elsewhere. A detailed neurological and radiological evaluation with magnetic resonance imaging(MRI) and computed tomography(CT) scan, revealed an occult OLF at D11-D12 level compressing the spinal cord. A meticulous decompression of the cord was achieved using a high speed burr to thin out the OLF and allowing the adherent portion to float. Deformity correction was deferred as the patient had good sagittal and coronal spinal balance, clinically. **Results and conclusion:** The patient had complete recovery of symptoms and returned to work at three months post-surgery. The neurology returned to normal at four months post-surgery. No intraoperative or post-operative complications were observed. The VAS and ODI scores showed significant improvement at 27-months follow-up. Association of OLF with congenital scoliosis has not been previously described in literature. A high degree of suspicion, a meticulous neurological examination and corroborative radiological evaluation, is imperative in all spinal deformity cases to detect an occult unrelated etiology of neurological deficit which may be masqueraded by the huge spinal deformity. High speed burr is an effective and safe tool to avoid complications like dural tear and neural injury in cases of OLF.

## Is delta fixation a safe and effective option in adult high-grade dysplastic lumbosacral spondylolisthesis?

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**Introduction:**The surgical management of high-grade(Meyerding grade III or more) dysplastic lumbosacral spondylolisthesis(HGDSL) with regional spinopelvic imbalance is challenging due to the difficulty in achieving reduction of slip and restoring the global sagittal spinal alignment without causing neurological deficits. There is a paucity of studies which have reported the midterm outcomes of surgical treatment using delta constructs (transsacral transvertebral screw fixation) for adult HGDSL. **Methods:**We analyzed the clinical, functional, and radiological outcomes of 11 patients(2 males, 9 females) with L5-S1 HGDSL treated with L5-S1 transsacral transdiscal screw fixation and insitu posterolateral fusion. **Results:**The mean age at presentation was 36.7+/-9.4(range, 21 to 55) years.All patients presented with instability type back pain with normal neurology with 60% presenting with concomitant radiculopathy.At a mean follow-up was 50.5+/-17.4 months(range, 38 to 96 months), the meanVAS score[pre-op: 8.4+/-1.2(7 to 9) vs post-op: 2.2+/-1.0( 0 to 3)] and ODI score [pre-op: 57.9+/-9.6 vs post-op: 14.9+/-3.8] showed significant improvement,  $p < 0.05$ .CT scan showed fusion at a mean of 9.3+/- 4.1 months(range, 9 to 12 months), with no evidence of progression in slip percentage or slip angle at the final follow-up.There were no neurologic deficits, implant failure or pseudoarthrosis at final follow-up.There was one case of superficial wound infection which settled with antibiotics.**Conclusion:**In-situ fusion with posterior lumbosacral transfixation using transdiscal screws (delta fixation) is a safe and effective technique, in the treatment of L5-S1 HGDSL as evidenced by the good clinical, functional and radiologic outcomes at mean follow-up of 50.5+/-17.4 months.

## Restoration of vertebral-pelvic parameters in the surgical treatment of spondylolisthesis: myth or reality?

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**Purpose:** To evaluate changes in spinopelvic parameters after surgical correction of isthmic spondylolisthesis of the L5 vertebra. **Materials and methods:** Retrospective analysis of treatment of 83 patients. Follow-up period was 1 year or more. 3 groups: LG Lamina repair - 49, LG TLIF - 17, HG TLIF - 17. Spinal and pelvic parameters were assessed before and after surgery and their approximation to target values as a percentage. **Results:** The PT and SS parameters do not change significantly. Lumbar lordosis and lower lumbar lordosis are closest to ideal parameters. Lower LL deficit from the ideal initial LG Lamina repair 29.37% (18.76-36.59), after surgery 15.67% (7.97-22.99), P value<0.0001; LG TLIF 27.68% (24.37-34.36), after 15.48% (12.37-18.98), ns; HG TLIF 57.85% (41.68-74.02), after 26.51%(15.93-37.1), P = 0.0063. Deficiency of LL ideal initially LG Lamina repair 12.58% (12.38-19.68), after surgery 11.6% (9.62-16.35), ns; LG TLIF 14.96% (10.73-26.59), after 6.33% (5.69-12.40), P=0.0374; HG TLIF 23.15% (15.54-40.08), after 11.22% (6.25-18.15), P=0.0210. **Conclusion:** The outcome of surgery is influenced by the deviation of LL from the target before surgery. Lumbar lordosis and lower lumbar lordosis are closest to target values in all groups.

## Delayed presentation of duodenal obstruction after acute scoliotic curve correction: A case report.

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**Introduction:** Superior mesenteric artery syndrome (SMA) is a rare but serious complication following scoliosis surgery. It occurs as a result of mechanical compression of the third part of the duodenum between the superior mesenteric artery and the aorta. This condition occurs most commonly in significantly underweight patients with severe deformities during the first few days to weeks following spinal corrective surgeries. Aortomesenteric angle gets reduced following spinal lengthening during spinal corrective surgery causing compression of the third part of the duodenum resulting in the development of SMA syndrome. **Case:** We present a case of a 17-year-old male with a 70-degree congenital scoliotic curve, in whom 68.5% correction was obtained with posterior instrumentation and fusion. The postoperative course was uneventful and was discharged after 15 days of surgery. On postoperative-day 30, the patient started developing episodes of vomiting with abdominal pain and distension, not improved by self-medication with antiemetics, which resulted in a rapid weight-loss of 11 kg. Clinical and radiological findings were suggestive of SMA syndrome. Due to the failure of conservative management, he was treated surgically by gastro-jejunostomy and side-to-side jejuno-jejunostomy on day 54 which improved his condition. **Conclusion:** Superior mesenteric artery syndrome can occur much later in the postoperative period than previously reported cases and with potentially life-threatening symptoms following scoliosis correction. Early recognition of the condition and institution of appropriate treatment is essential to prevent the occurrence of complications including risk of intestinal perforation and mortality. Diagnosis requires a high index of suspicion.

## Can a simple smartphone be a cornerstone in School Health screening program for detecting scoliosis in resource poor developing countries? – Revisiting the “Scoliometer”

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### Purpose

Scoliometer is an inclinometer that quantifies rib hump which indirectly measures the degree of scoliosis. It is now possible to use various apps which can methodically function same as a Scoliometer. In our study, we revisit the reliability, validity of scoliometer; its correlation with various app based digital inclinometers and try to extrapolate the role of digital inclinometers in the overall diagnostic accuracy of Scoliosis.

### Methods

An observational study was conducted on patients with Early onset Scoliosis and Adolescent Idiopathic scoliosis. Two independent observers noted three scoliometer values separately. Cobbs angle, Apical vertebral rotation (Nash-Moe grading and CT) and SRS-22r questionnaire were also noted. The accuracy and reliability of app based digital inclinometers were also analysed. All the values were compared statistically.

### Result

The interobserver agreement for Scoliometer instrument and App based digital inclinometers were found Strong to Substantial respectively. A strong positive correlation exists between Scoliometer and digital inclinometers from the same patients. Except for SRS-22r score which has a substantial negative correlation, all radiological parameters have a substantial to strong positive correlation. A mathematical formula was also derived between Scoliometer values and Cobb's angle. Based on that, a suitable referral criterion of 7 degree of digital / manual Scoliometer value to higher center was opined.

### Conclusion

Scoliometer and App based digital inclinometers have a strong predictive power to measure the degree of deformity in Scoliosis. If incorporated into latest School Health Screening Programs, these instruments have the potential to decrease the overall burden of Scoliosis in society.

## Mid-term Results of Cast-Brace Rotation Treatment for Early-onset Scoliosis

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**Introduction:** As repeated general anesthesia (required by casting) has been questioned for possible brain damage, interest in bracing is growing in conservative early-onset scoliosis treatment. We aimed to analyze the mid-term clinical results of cast-brace rotation treatment for early-onset scoliosis.

**Materials & Method:** We performed a retrospective study in a consecutive cohort. Inclusion criteria were discovered scoliosis and initiated treatment below age 5; exclusion criteria: previous spine surgery. With a yearly cast-brace cycle, the cast-brace rotation treatment (CBRT) was repeatedly applied until the scoliosis was cured or surgical intervention was required. The change in the major curve angle and complications of CBRT were analyzed.

**Results:** Twenty-nine children were included. Fourteen patients had idiopathic scoliosis, and 15 had secondary scoliosis. Cast treatment was initiated at  $3.1 \pm 1.9$  years of age, and the patients were followed up for 4.3 years. An average of 2.9 casts were performed. The mean major scoliosis angle was  $45.8 \pm 8.8$  degrees at the first visit; this was corrected to  $23.7 \pm 12.3$  degrees at the first cast application and  $31.6 \pm 18.7$  degrees at the final visit. Seven patients were cured and six patients underwent surgery. Patients with idiopathic scoliosis tend to have better results compared to secondary scoliosis. The position of the apical vertebrae does not appear to influence the results. The cast-related complication rate was 6.9%, and most complications were skin problems.

**Conclusion:** For patients with early-onset scoliosis, CBRT might be effective in the mid-term. This should be considered a time-buying treatment option for EOS.

## Curve progression after terminating brace at Risser 4

- Can PFMI (Proximal Femur Maturity Index) give us more detailed evaluation? -

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**Background:** It is important to evaluate bone maturity for brace therapy of Adolescent Idiopathic Scoliosis (AIS). The commonly used Risser sign often indicates growth arrest at Risser 4, however, some cases show growth. We investigated the curve progression after termination of brace at Risser 4 using Proximal Femur Maturity Index (PFMI), which can be evaluated by the whole spine radiographs. **Methods:** Of the AIS patients seen from 2010 to 2021, 72 patients (all girls) who started brace with Cobb angle 20-40 degrees and finished it at Risser 4 were included. Height was measured at each visit. The radiographic parameters (Risser sign, PFMI and Cobb angle) were retrospectively collected. **Results:** At the termination of brace in Risser 4, the mean age was 15.2±1.0 years, the mean Cobb angle was 32.1±6.4 degrees. Overall, the mean curve progression was 1.79 degrees until the last follow-up, and 11.1% (8 cases) progressed more than 6 degrees. Risser 4 period was divided into PFMI grade 5: 59.7% (43 cases) and grade 6: 40.3% (72 cases). Cobb angle worsened more in patients who terminated brace at PFMI grade 5 than in those who at grade 6. (p<0.0001) Annual growth in height was less than 1 cm at Risser 4 (0.80±0.8 cm/year), which is the indication of growth arrest, however, there was still growth potential at PFMI grade 5 (1.84±1.4 cm/year), and growth arrest occurred at grade 6 (0.34±0.7 cm/year). **Conclusions:** The PFMI may help predict the cessation of growth and curve progression in Risser 4.

## Impact of anterior surgery for K-line (-) and/or huge ossification of posterior ligament (occupying ratio > 50%) in cervical spine

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### Purpose:

The patients who have apparent neurological disorders with ossification of posterior ligament (OPLL) in cervical spine, need surgical intervention. There are two main surgical approaches; anterior and posterior. The aim of this study is to investigate the pros and cons of anterior surgery for the patients with K-line (-) and/or huge OPLL (occupying ratio > 50%) in cervical

### Materials and Methods:

Twenty-two patients who were suffered from cervical OPLL [K-line (-) and/or occupying ratio > 50%] and underwent anterior surgery, were included in this study. All patients underwent surgical resection or floating method of OPLL and anterior fusion, W/WO posterior fixation. All patients were followed more than 12 months and evaluated with JOA score. Surgical invasiveness; surgical time and blood loss and complications; neurological deterioration, CSF leakage, C5 palsy and so on, were investigated.

### Results:

Average surgical time was 250 minutes and average blood loss was 317 ml. Average JOA score was 10.7 preoperatively and improved to 14.1 at final follow up. The mean recovery rate was 59%. The local alignment was 0.5 degrees kyphotic preoperatively and 4.6 lordotic at final follow-up. Dura tear was occurred in 2 case and one of them needed spinal drainage for 1 week. C5 palsy was seen in 3 cases and improved spontaneously. Four cases required additional surgery postoperatively.

### Conclusions:

Anterior decompression and fusion provided good surgical results for the patients with huge OPLL with high rate of severe complications.



## Safety and efficacy of Arthroscopic-assisted Uni-portal Spinal Surgery for surgical treatment of lumbar spinal stenosis

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**Introduction:** A novel Arthroscopic-assisted Uni-portal Spinal Surgery (AUSS) is divided into a working channel and an observation channel, but the two channels of this technique are located in the same soft incision. This study aimed to evaluate the safety and curative effect of AUSS technique for the treatment of lumbar spinal stenosis. **Methods:** From August 2022 to August 2023, this retrospective study recruited 33 patients with lumbar spinal stenosis who underwent uni-portal arthroscopic unilateral laminotomy bilateral decompression technique for spinal stenosis decompression. The postoperation neurological function and pain status were evaluated by the VAS score of pain and ODI. The data, including preoperative comorbidities, operation time, the quantity of bleeding, bed rest time, and intraoperative and postoperative complications, were recorded. **Results:** The mean operation time was 40 minutes, the mean quantity of bleeding was 50 mL. All patients were followed-up for 6 months. The mean preoperative VAS score was  $7.3 \pm 1.3$ , while postoperative 1 months, 3 months, and final follow-up VAS scores were  $1.8 \pm 0.7$ ,  $1.1 \pm 0.6$ , and  $0.8 \pm 0.6$ , respectively ( $P < 0.001$ ). The mean preoperative ODI score was  $72.4 \pm 1.2$ , while postoperative 1 months, 3 months, and final follow-up ODI scores were  $28.5 \pm 3.9$ ,  $22.6 \pm 4.1$ , and  $12.5 \pm 3.3$ , respectively ( $P < 0.001$ ).

**Conclusion:** Arthroscopic-assisted uni-portal unilateral laminotomy bilateral decompression technique for the treatment of spinal stenosis is an safe, and effective minimally invasive surgery for patients with lumbar spinal stenosis

## Discectomy, Arthrodesis or Disk Replacement - what best procedure for recurrent lumbar hernia ?

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LDH (Lumbar Disc Herniation) occurs mainly between the fourth and fifth decades of life and only 5% of patients become symptomatic. Typically, after a few weeks of conservative treatment, the symptoms will resume, but with recurrence in approximately 5 to 15% of cases, regardless of the type of treatment administered.

rLDH is the primary cause of poor outcomes of discectomy. It is defined as ipsilateral or contralateral disc herniation at the same level after a pain-free interval of at least 6 months following conventional discectomy. rLDH are a common complication of any kind of discectomy, according to literature, and vary from 3-18%.

Many factors are linked to rLDH such as age, BMI, smoking, higher disc height with or without degenerative spine segments - disc, facet tropism, extruded hernias.

Due to biomechanical factors, the risk of L4-L5 re-herniation is twice that of L5-S1. Obese patients were reported to be 12 times more likely to experience recurrent herniation and 30 times more likely to undergo revision surgery than non-obese patients.

Concerning surgical treatment, one technique to reduce re-herniation rates is a more aggressive disc resection, but it is also associated with quicker progression of intervertebral degeneration and axial pain. Moreover, reintervention leads to psychological and physical suffering and economic burden, therefore, the intervention should be as effective as possible. Our aim is to do a literature review and discuss in which cases it would be better to perform only a discectomy, arthrodesis, or disc replacement - as a first or second intervention.

## Modic Changes in Lumbar Spine: Relation with Low Back Pain and Treatment

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Modic changes are a set of distinctive findings observed in the vertebral endplates & adjacent discs, which has drawn significant attention in spine surgery. These alterations, first observed by de Roose in 1987 and described by Michael Modic in 1988, involve alterations in the vertebral bone marrow visualized on magnetic resonance imaging (MRI). They are considered as important markers of degenerative disc disease and are usually associated with various clinical symptoms.

Three types of Modic changes have been described. Type-I, which is characterized by hypointense signals on T1-weighted images & hyperintense signals on T2-weighted images, indicates edematous and inflammatory processes. Type-II shows hyperintense signals in both T1 and T2 weighted signal images suggesting fatty degeneration, whereas Type-III exhibits hypointense signals in both T1 and T2 weighted images, representing sclerotic changes.

The underlying pathophysiological mechanisms of Modic changes are still under investigation, but it is reported to be closely related to degenerative disc disease causing chronic low back pain. Moreover, Modic changes are more prevalent in patients with a history of disc herniation & various risk factors are associated, eg: age, genetic predisposition & lifestyle. Modic changes affect 6% of adult population from the age of 25 to 40 years.

The symptoms of Modic changes are multifaceted. They have been associated with increased pain & disability, although may remain asymptomatic in many individuals. The management is still unclear but the treatment approach usually includes conservative measures and surgical interventions as well, eg: laminotomy and discectomy; laminectomy, discectomy, fusion and fixation.

## Effectiveness Of Pre-Operative Distraction Using Modified Halopelvic Ilizarov Distraction Assembly for Correction of Severe Spine Deformities

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**INTRODUCTION:** Keeping in view the halo-pelvic distraction as an effective and affordable means of treatment, which can also be modified to reduce the rate of complications, a halo-pelvic apparatus was designed using standard Ilizarov set.

**METHODS:** Patients presented to the department with various spinal deformities from January 2021 to August 2023 were applied modified halopelvic assembly before definitive surgery of kyphoscoliosis. Modified assembly consisted of a pelvic component made from 2 Ilizarov femoral arches, connected to each other anteriorly, through a threaded rod. The posterior aspect of the assembly was kept free from any rods or arches so that patient could lie supine. The Ilizarov femoral arches were anchored to the pelvis bone with Ilizarov half pins (6mm in adults and 5mm in children).

**RESULTS:** Modified assembly was applied to sixty two patients (age range 8-36years 20M/12F), among them 54 presented with kyphoscoliosis (of various etiologies including 7 post caries severe kyphotic deformities with maximum Cobb angle of 168), 01 with cervical scoliosis and 07 with cervical trauma. More than 60% improvement in magnitude of deformity was noted in all cases of kyphoscoliosis with improvement of neurology in 4/5 paraplegic patients. Two patients gained grade 4 power in 1st week of distraction while other two gained grade 2 power.

**CONCLUSION:** The results of this study reveal that our modified halo-pelvic Ilizarov distraction assembly is a device with unlimited potential, which can achieve good correction in various severe spinal deformities without significant risk to neurology, fewer complications and good patient compliance.

## Optimal surgical approach in treatment of degenerative lumbar spondylolisthesis – update on the everlasting debate.

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### Introduction

Degenerative lumbar spondylolisthesis (DLS) with consequential lumbar spinal stenosis (LSS) is a frequent cause of low back pain in adults. Surgery is an effective treatment of DLS. Decompression with fusion is currently the most common procedure for surgical treatment of spondylolisthesis, despite not being able to provide better results in terms of Oswestry disability index (ODI) scores, back or leg pain. There are still no clear guidelines to help spinal surgeons choose between decompression alone (DA) and decompression plus fusion surgery. This article provides insight into new evidence regarding the everlasting debate in treatment of degenerative lumbar spondylolisthesis– to fuse or not to fuse?

### Materials and methods

A PubMed search was carried out to find all relevant papers that have been published in the last 10 years in order to identify the latest available evidence. Studies published in English language that focused on decompression and decompression plus fusion in treatment of lumbar degenerative spondylolisthesis were eligible for inclusion in this study. Papers were analyzed systematically for the purpose of collecting and presenting relevant information for this mini review.

### Conclusion

Decompression alone is not inferior to decompression plus fusion in treatment of DLS. On the contrary, DA is associated with lower intraoperative bleeding, hospital complication rate, and operation time. Furthermore, recent studies showed that adding fusion may not be associated with better ODI scores or improvement in back or leg pain. However, more evidence is needed in order to make clear guidelines for the treatment of DLS.

## Lateral vs. posterior approach percutaneous endoscopic lumbar discectomy for L5-S1 disc herniation

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Introduction Lumbar disc herniation is a common spinal pathology and now endoscopic discectomy is a minimal invasive method for clinical choice. Both lateral and posterior approaches endoscopic discectomy are suitable for these patients, and the clinical data are little for the comparison of these approaches.

Methods We collected the clinical data of our single center of the surgeries of L5-S1 disc herniation, including the patient basic parameters, the radiological data, and the operative data.

Results The age, sex, BMI and accompanied diseases were comparable for the two groups. The VAS score was decreased for both group patients, and the ODI parameters were also improved. The fluoroscopic time was significant longer in the lateral approach group than the posterior group. However, the total operative time course did not show any difference for the two groups. The blood loss was minimal for both approaches. There were no recurrences of disc herniation for the two groups.

Conclusion Both lateral approach and posterior approach are suitable for L5-S1 disc herniation, except that the surgeon would have more X-ray exposure of fluoroscopy.

## Epidural bone marrow aspirate concentrate (BMAC) versus platelet rich plasma (PRP) injection for lumbar herniated disc disease – Randomized controlled trial

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**Introduction:** Lumbar herniated disc disease (LHDD) is treated conservatively by all the health care providers unless there is a surgical emergency. Epidural steroid (triamcinolone) injection remains the cornerstone in the management of LHDD, which offers pain relief for up to 3 months. Epidural biologics offer better pain relief and disc regeneration. Various studies support short to medium to long term effects, and safety of various biologics in treating LHDD. We aimed to compare epidural bone marrow aspirate concentrate (BMAC) versus platelet rich plasma (PRP) in single level LHDD.

**Materials and methods:** A total of 36 patients were treated by transforaminal epidural BMAC (n=18) and PRP (n=18) injections. Both the groups were followed up at baseline, 1, 3, and 6 months post-procedure with VAS score as primary endpoint and Oswestry Disability Index (ODI), adverse event, and treatment failure as the secondary endpoints.

**Results:** Patients treated by epidural BMAC injections showed statistically and clinically significant reduction in VAS at 1, 3, and 6 months, and in ODI at 6 months than epidural PRP injections. No adverse event occurred in either group.

**Conclusion:** Epidural double-spin BMAC yielded superior results to double-spin PRP on lumbar disc disease. Due to its efficacy and safety, the procedure is recommended in treating single level lumbar herniated disc disease.

## Robotic Navigation-Assisted Anterior Cervical Surgery

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**Introduction:** While robots have gained prominence in thoracic and lumbar instrumentation, their application in cervical spine surgery remains limited. The latest generation of spine robots offers navigation capabilities, enhancing safety during implant placement in anterior and posterior cervical procedures. This study presents the inaugural case series utilizing a third-generation spine robot with navigation capabilities in various anterior cervical spine surgeries. **Methods:** Thirty patients undergoing robotic-assisted cervical spine surgery were analyzed. All procedures utilized the Mayfield clamp to secure patients and minimize cervical spine movement for navigation accuracy. Bone mounts were omitted. Procedure times, including O-arm and robot registration durations, and mean radiation exposure were recorded. Postoperative O-arm scans assessed implant positioning. **Results:** Instrumentation ranged from C4-C5 cranially to C6-C7 caudally. Mean O-arm and robot registration times were 4.4 and 3.5 minutes, respectively, with a mean radiation dose of 26.1 mGy. Postoperative imaging confirmed precise implant placement. One patient experienced cardiac arrest post-procedure but was successfully resuscitated without permanent neurological deficits observed in any patient. **Conclusion:** The utility of spine robots extends beyond thoracolumbar pedicle screw placement. Leveraging navigation capabilities, robots ensure accurate implant placement in cervical spine surgeries, aiding in both decompression adequacy assessment and reducing procedural risks.



## Robotic Assistance in Posterior Cervical Surgery

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**Introduction:** While robots have gained traction in thoracic and lumbar instrumentation, their application in cervical spine surgery remains underexplored. Modern spine robots offer navigation capabilities, enhancing safety in implant placement for both anterior and posterior cervical surgeries. This study presents the inaugural series utilizing a third-generation spine robot in posterior cervical spine surgery. **Methods:** Twenty-two patients undergoing robotic-assisted posterior cervical spine surgery were analyzed. The robotic arm assisted in the insertion of eighty pedicle screws and 130 lateral mass screws. Utilizing the Mayfield clamp, patients were secured to minimize cervical spine movement and ensure navigation accuracy. Bone mounts were omitted. Procedure times, including O-arm and robot durations, and mean radiation exposure were recorded. Postoperative O-arm scans assessed pedicle screw accuracy, graded using the Gertzbein-Robbins classification. **Results:** Instrumentation ranged from the occiput cranially to C7 caudally. Mean O-arm, robot registration, and screw insertion times were 4.4, 3.5, and 3.5 minutes, respectively, with a mean radiation dose of 26.1 mGy. Postoperative imaging confirmed accurate implant placement, with clinically acceptable positioning observed in all cases. Two patients developed superficial wound infections, managed conservatively with oral antibiotics and dressings. The 90-day reoperation and mortality rates were 0%. **Conclusion:** Beyond thoracolumbar pedicle screw placement, spine robots ensure precise implant positioning in posterior cervical spine surgery. This study highlights the potential of robotics to enhance surgical accuracy and safety in cervical spine procedures.

## C5 Palsy Following Anterior Decompression and Fusion Surgery for Cervical Degenerative Disorders – a review based on clinical case

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Postoperative C5-palsy (C5P) is a frequent complication following cervical decompression, but the physiopathology is not completely understood. The prognosis is generally good, but some predictors are associated with incomplete recuperation: the underlying pathology, multilevel disease, decompression degree, presence of T2-weighted high signal changes (HSCs) in the spinal cord, less pre-operative cervical lordosis, correction to cervical kyphosis and co-occurrence of biceps muscle weakness. A 62 year-old man presented with complaints of gait unbalance, loss of fine motor skills, and cervicobrachialgia. Tetraparesia global MRC scale grade 4 was noted, with hyperreflexia and gait ataxia. The MRI showed Degenerative Cervical Myelopathy (DCM) at C3-C4-C5-C6 with HSCs at C5 level, with maintained cervical lordosis. MJOA Score:9. The patient underwent 3 level ACDF with lordotic cages (8mm,7mm and 5mm). The surgery was uneventful. On the immediate post operative, left CP5 was diagnosed and the patient was oriented to rehabilitation care, with resolution of symptoms after 5 months of treatment. The EMG showed no radicular lesion. Although our patient presented some of the predictors of worse prognosis, the evolution was favorable with conservative treatment. Conclusion: cervical decompression surgery is associated with C5P, and deltoid strength and C5 dermatome sensibility should be systematically evaluated. The surgeon should be aware that some predictors can be related with incomplete recovery but the prognosis is generally good.

## Degenerative lumbar scoliosis - final stadium of spine aging

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Introduction: DLS is final phase of spine aging. Aim of this study was to present spine aging in different phases, its accelerating factors, possibilities of treatment. Patients and methods: Including criteria were: degenerative deformity of lumbar spine with pronounced symptoms that indicated surgical treatment. Totally 205 patients were analyzed with minimal follow up of 2 years (2-15). Results: Average age was 71 years, female gender 69%, average BMI 32, comorbidities at 81%. At the final follow up, 94% of them were able to walk independently, rest of them could not due to neurological and other comorbidities. All patients had significantly reduced pain level, and improved mobility. Mortality rate in first month was 1%, and overall revision rate was 15 % due to wound dehiscence and epidural haemathoma; later revisions were performed due to „adding on“, implant loosening, etc. Discussion: DLS affects mostly obese patients with other comorbidities, additionally reducing their functional status. Process in not limited on 1 or 2 spine levels but on whole L spine. Aim of surgery is not only to restaurate balance (more important sagittal), but also to stabilize spine and decompress neural structures. Such interventions are very complex, aggressive, and risky. If done properly it dramatically improve patient's life, still complication rate are high. Conclusion: Patient selection and her/his cooperation (weight reduction, muscle exercising, control of other diseases, rehabilitation process) are essential for long-term success of this intervention.

## Adult scoliosis- challenges in management

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Adult scoliosis is defined as a coronal plane deformity  $\geq 10^\circ$  in a skeletally mature patient. They can produce global sagittal imbalance. The primary goal is to provide pain relief, restore spinal balance and to improve the quality of life- minimising chance of complications. Selection of appropriate treatment for degenerative scoliosis is challenging because the condition is heterogeneous with diverse presentation. It should be individualised considering patients age, co-morbidity, expectation, magnitude of deformity and quality of bones. Surgical options may include decompression alone- which may be open or minimal invasive- or decompression and instrumented fusion. Elderly patients with multiple medical problems having neurogenic claudication with or without radiculopathy with no or minimal back pain, instability or significant imbalance are the candidates for decompression alone. Fusion is usually indicated if back pain is a leading symptom. The curves in adult scoliosis are rigid in . So, an adequate posterior release is mandatory. Many cases may require additional anterior release or spinal osteotomies. Multiple level fusion causes excessive blood loss and often needs autologous transfusion. Multi-level lumbar or thoraco-lumbar fusion may also require spinopelvic fixation. Even after that, pseudoarthrosis, implant failure, adjacent segment disease, distal and proximal junctional failures are common. There is also a high chance of post operative pulmonary, cardio-vascular, thrombo-embolic, renal and other medical complications along with severe bleeding and infection. Fixation in weak osteoporotic vertebrae is also a real challenge. Use of PMMA augmentation, fenestrated or expandable or large diameter screws can be used to tackle this problem.

## Preliminary outcome of foraminal decompression via paraspinal approach of UBE spinal surgery for lumbar foraminal stenosis

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### 【Background】

Owing to better detailed surgical field visualization, foraminal decompression via paraspinal approach of unilateral biportal endoscopic (UBE) spinal surgery for lumbar foraminal stenosis is considered a good alternative method compared to open surgery. Herein, we manifest a preliminary clinical result of 20 patients underwent UBE foraminal decompression for lumbar foraminal stenosis.

### 【Methods】

Clinical and radiographic data of 20 consecutive patients of foraminal stenosis treated between Nov 2018 and Jan 2021 using UBE paraspinal approach were reviewed. An average age of 65.3. Above all, 14 patients were primary surgery, and 6 patients were revisional surgery. This is a retrospective study from chart review and image analysis. Outcome was evaluated using the visual analog scale (VAS) for back pain and lower leg symptoms, the Japanese Orthopedic Association (JOA) scores for functional recovery, the Oswestry Disability Index (ODI) for degrees of disability, and modified MacNab criteria for overall treatment outcomes.

### 【Results】

The average follow-up period was 10.15 months (2-32 months). At the final follow-up, the mean VAS for low back pain was improved from 6.1 to 2.25 and the VAS for leg symptoms was improved from 6.45 to 2.55. The mean JOA score and ODI was significantly improved from 13.95 to 27.65 and from 46.5 to 23.5, respectively. Modified Macnab criteria were excellent in 7 patients, good in 13.

### 【Conclusion】

Decompression for foraminal stenosis via UBE paraspinal approach technique revealed satisfactory clinical result and can be performed safely and effectively. It could be considered an alternative method compared to conventional open surgery.

## What-er went wrong?: Systemic effects of irrigation fluid in endoscopic spine surgeries

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Case: A 37-year-old male American Society of Anesthesiologists (ASA) grade 1 patient with lumbar canal stenosis (LCS) at the L4-L5 level, with symptoms of neurologic claudication in bilateral lower limbs underwent endoscopic decompression. The procedure was prolonged to 5h, with usage of 60L of saline due to some intraoperative difficulty. Towards the end of the procedure, the patient developed sudden-onset bradycardia followed by ventricular arrhythmia and acute onset pulmonary-edema. The patient went into cardiorespiratory collapse, and immediate resuscitative measures were initiated. The patient was successfully managed with resuscitation and supportive management, and recovered uneventfully thereafter. The exact cause of this collapse was a dilemma. An important cause of this decompensation could be endoscopic irrigation fluid dynamics and its effect on the body fluid due to systemic absorption. However, after performing a detailed investigative panel, a diagnosis of peri-operative Takotsubo stress-cardiomyopathy was subsequently made, with possible contribution of the fluid overload due to overuse of irrigation fluid. Another cause of pulmonary edema post-operatively could be negative pressure pulmonary edema. Takotsubo stress cardiomyopathy may present in an atypical form in peri-operative cases, without the typical apical ballooning which was earlier considered pathognomonic of this condition. Conclusion: The possibility of takotsubo cardiomyopathy (TCM) should be considered in cases of acute perioperative cardiac decompensation and pulmonary-edema in patients undergoing spinal surgery. At the same time, during endoscopic surgery certain guidelines and instructions if adhered to, can lead to reduction in the systemic absorption of irrigation fluid and avoid its detrimental effects.

## Does the Schizas classification predict clinical symptoms of Lumbar Spinal Stenosis?

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The high incidence of degenerative lumbar spinal stenosis (LSS) in the elderly population makes it a common pathology. The Schizas classification, based on the observation of nerve roots within the dural sac on MRI, offers a radiological assessment of stenosis severity. Our objective was to analyze the relationship between this classification and clinical symptoms associated with degenerative lumbar stenosis. We reviewed the records of 40 patients treated for degenerative LSS over a 5-year period. We correlated the Schizas classification with neurological examination findings, walking distance, and pain severity. Results: We found a significant association between motor and sensory deficits and pain severity on one hand, and the Schizas classification on the other hand. However, there was no significant correlation between this classification and reduced walking distance. Several studies have attempted to correlate clinical symptoms with quantitative radiological parameters (size and perimeter of the lumbar canal). However, few studies have correlated clinical symptoms with qualitative morphological parameters of the spinal cord. Radiological findings alone are insufficient to define the severity of the pathology and justify treatment for canal stenosis. Therefore, we recommend that treatment choice (surgery or conservative treatment) in patients with LSS should be primarily based on the degree of clinical involvement. In conclusion, although our study did not show an absolute correlation between the Schizas classification and all clinical symptoms of degenerative lumbar spinal stenosis, some significant associations were observed. These results emphasize the importance of a thorough clinical evaluation in managing this pathology, thereby helping guide treatment choices.

## Diagnosis of C4 Radiculopathy

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**Introduction:** Cervical nerve root compression causes neck and scapular pain, and its location indicates the affected root. Furthermore, C5 to C8 radiculopathy is usually accompanied by specific neurologies. However, features of C4 radiculopathy are not well-known. **Methods:** We retrospectively studied patients who underwent posterior foraminotomy of the unilateral C3-4 intervertebral level between 2012 and 2018 and showed improvements within 1 month after surgery. We collected data on symptom duration, site of neck pain, Spurling test, imaging findings, selective root block (SRB) effect, and surgical results using a cervical radiculopathy scoring system (normal=20 points). **Results:** In total, eight patients were included, with mean age of 73 (range, 52-83) years, and mean follow-up of 2 years. Symptom durations were 3 months to 5 years and exceeded 1 year in five patients. All patients reported unilateral nape pain of the suboccipital and upper trapezius region. Spurling test elicited reproduction or increase of nape pain in every patient. Plain radiographs showed facet joint hypertrophy and foraminal stenosis at C3-4 level on the symptomatic side in every case. Those findings were also clear on magnetic resonance imaging and computed tomography scans. In five patients who underwent SRB, pain reproduction and its temporary relief were obtained. Cervical radiculopathy scores ranged from 9 to 15 points before surgery, and from 16 to 20 after surgery. Mean improvement rate was 90%. **Conclusion:** Elderly patients suffering for long time from unilateral nape pain with positive Spurling test may have C4 radiculopathy.



## Torticollis and high cervical myelopathy in a known case of rheumatoid arthritis due to rotatory subluxation of atlas over axis

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Rheumatoid-arthritis (RA) affects cervical spine in 23%-86% of cases. Cervical spine is the third most common location affected and is often asymptomatic, making timely diagnosis and management imperative, to avoid potential complications like myelomalacia, obstructive-hydrocephalus, and sudden-death. RA progresses from atlanto-axial-instability (anterior-subluxation > posterior, lateral subluxation) to basilar invagination. 33.3% have severe atlanto-axial-instability causing myelopathy. We present a unique case of a 55-year-old female with painful torticollis and myelopathy due to rotatory-subluxation of atlantoaxial-joint. Case: A 55-year-old female with untreated RA for 5 years, presented with sudden-onset neck-pain for 1-month, restricted range-of-motion and left-sided torticollis. Signs of myelopathy were present. Z-deformity in bilateral hands and feet was seen. Radiology suggested atlanto-axial rotatory-subluxation with craniovertebral junction (CVJ) kyphosis. Posterior-Atlanto-Dens-Interval (PADI) was 7.07mm. Lateral-overhang of C1-arch at right side, exposed left superior-articular-process of C2, and retroverted-odontoid, indicating right rotatory-subluxation was seen. Altered signal at surface of dens was suggestive of its erosion. ESR, CRP were raised. Neck pain improved with bed side traction. Reduction and posterior C1-C2 fusion was planned. Reduction was obtained by releasing the posterior facet capsule and opening C1- C2 joint assisted by intra-operative-traction. Posterior instrumentation and fusion was done. Patient had symptom resolution. Post-operative PADI was 13.6mm and CVJ anatomy was restored. Patient was started on hydrochloroquine given increased disease activity. Conclusion- Rotatory subluxation of C1-C2 is a rare and challenging finding seen in RA. It is frequently asymptomatic and patients often present with advanced disease. Hence, regular screening of craniovertebral-junction in RA is of paramount importance.

## Thoracic ossification of Ligamentum Flavum in Indian men with spinal canal stenosis with spastic paraparesis and treatment with laminectomy with high-speed burr with constant irrigation: A report of two cases

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**Introduction:** Ossification of ligament flavum (OLF) is a pathological heterotopic ossification in lower thoracic level due to strong traction force with kyphotic alignment. We report two cases of lower thoracic OLF with spastic paraparesis treated with laminectomy with high frequency burr. **Case 1:** A 51 years old male with pain in dorso-lumbar spinal for 4 years, tingling and numbness, slipping of shoes, hypoesthesia at T9-12 with increased tone bilateral lower limb, exaggerated superficial and deep tendon reflexes, plantar extensor response and ankle clonus, with normal bowel bladder. CT scan revealed ossified ligamentum flavum in T9-10, T10-11 and T11-12 with remarkable stenosis. MRI showed low intensity lesion with intracanal occupation at the T11-12 level. Spinal decompression at T9-10, T10-11 and T11-12 were done by bilateral laminectomy with the help of high frequency burr. The dura was fully decompressed with free mobility without any remnant of ossification. **Case 2:** A 37 years old male with pain in dorso-lumbar region with radiation to right lower limb, tingling, numbness, and weakness, imbalance while walking and slipping of shoes. MRI imaging showed OLF with spinal canal stenosis. Spinal decompression was done at T10-11 via bilateral laminectomy using high frequency burr. **Discussion:** For osteotomy in spine surgeries, high-speed burrs are widely used, however, the heat generated by the tip of the device may lead to the damage to the neighboring neural tissues and may also lead to osteonecrosis. we used high-speed burr for the decompression with constant irrigation with normal saline to prevent the dural injury.

## Radiologic and clinical outcome comparison between expandable and static cages in open TLIF surgery: Two years retrospective cohort study

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Transforaminal lumbar interbody fusion (TLIF) effectively treats degenerative lumbar spine issues. However, complications like nerve traction injury and cage migration are common. Expandable cages aim to minimize these issues by allowing for easier insertion and preventing over-traction of nerves, while expanding disk space. This study compared radiologic and clinical outcomes between expandable and static cages, analyzing complications. Between Jan. 2021 and Jan. 2023, TLIF patients were divided into expandable (101 patients) and fixed cage (103 patients) groups. Both groups showed significant improvement in disk height and fusion segmental lordosis post-operatively, with expandable cages demonstrating greater improvement. Expandable cages had no cage migration compared to 2.9% in fixed cages. However, expandable cages had a higher rate of breakage (3 cases vs. 1 in fixed cages) and fewer instances of cage subsidence (1 vs. 4 in fixed cages). Both groups experienced decreased disability (ODI) and leg pain (VAS), with the expandable group showing better leg pain relief. Back pain (VAS) decreased gradually in both groups, with the expandable group experiencing less back pain at 1-year and 2-year follow-ups. In summary, TLIF with both expandable and static cages improves disk height and lumbar alignment. Expandable cages exhibit fewer migration and subsidence issues and offer better functional outcomes but have a higher risk of breakage.

## Effect of mini-plate fixation on open angles and complication in unilateral open-door cervical laminoplasty

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Cervical laminoplasty is an effective and safe surgery for cervical canal stenosis and cervical OPLL. The Centerpiece

mini-plate is an instrument used to secure the laminae and maintain cervical canal expansion.

**METHODS:** 60 patients received unilateral open-door cervical expansive laminoplasty. The group included 20

females and 40 males, with mean age of 71 years. Between July and November, Group A (30 Pts) was using the

mini-plate. Between January and June, Group B (30 Pts) was using suture suspension. We compared open angles group

A and B in post operative CT.

**Surgical technique:** After receiving general anesthesia, the patient is positioned prone. The opening side is made on the left side. On the open side, we create a trough by completely removing the ventral

cortex. Hinges are created by making another trough on the right side. The dorsal cortex and the cancellous bone are

removed. The lamina is opened carefully. In group A for the mini-plate fixed C4 and C6 laminae. In group B, the laminae are fixed using

Hirabayashi classic open-door laminoplasty techniques.

**RESULTS:** C5 open angle was  $36\pm 0.48$  degree in group A,  $46\pm 1.7$  in group B ( $p < 0.001$ ). No significant differences were found between group A and B in pre- and post ope JOA scores. In C5 plasty, three in group A, two in group B. Three screws

were back out. Two in group B were performed re-operation caused laminae closure.

**DISCUSSION AND CONCLUSION:**

The mini-plate can keep same open angle and might be possible to prevent re-operation.

## Endoscopic techniques for multilevel spine Degeneration. Do we need fusion ?

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Newer innovation of endoscopic techniques and concept can be used in treatment for Lumbar, Cervical and Thoracic degeneration.

Where are we now, after endoscopic techniques show many advantages in preserving anatomic structures compare to open surgery in degenerative spine.

The nature of illness of Lumbar degeneration. The description of Lumbar degenerative cascade regarding anterior and middle column by theory of Kirkaldy Willis (1978) should be completed with Baastrup theory (1933) describing posterior column degeneration. Baastrup theory was supported by Bristol study (2010) and Auckland study (2012). Proposed New classification based on 3 columns theory of biomechanic construct degenerative changes (Darwono-Radchenko,2018), describe completely the pathologic changes/deformer of spine degeneration involving three columns and could be used to justified various evidenced based treatment. The nature of illness of degenerative spine deformity is combination of 2 factors:

-stabilizer: disc, facet joint, ligaments, muscles

-Pathologic changes/deformer: osteophyte, facet trophism, spinal canal stenosis, flavum infoldings and degeneration, enlargement of spinous process, Kissing spine and laminae (3 columns theory)

Gold standard is open decompression surgery, but this technique will sacrifice some of the stabilizer and need artificial stabilizer or fusion device to gain the stabilization again.

Reasonable concept of endoscopic techniques for degenerative spine diseases is decompression to remove the deformer only, while preserving the stabilizer through minimally invasive technique. This concept will support the nature of healing, reapplied the spine stabilizer again and the result is correction of the spine deformity without fusion.

## Masquerading spinal epidural abscess: An unexpected presentation

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Case: A 21-year-old healthy male suffered an episode of strain to the mid-back region, and presented after seven days of strain due to delayed-onset, rapidly-progressive paraparesis. There was no history of a febrile episode. A clinico-radiological diagnosis of spinal epidural hematoma (SEH) was made due to the presence of a soft tissue mass in the epidural space and suggestive history of a closed injury in the form of mid-back strain. Surgical decompression was done because of rapidly progressive neurodeficit in a young patient with bowel bladder involvement. Intraoperatively, pus was encountered in place of a hematoma, which was evacuated and thorough lavage was given. The diagnosis was revised to a spinal epidural abscess (SEA), possibly due to a secondary infection of the hematoma, though the possibility of it being a primary SEA cannot be completely ruled out. Gradual and full recovery was made with appropriate antibiotic therapy and aggressive physiotherapy.

Conclusion: Spontaneous SEA may occur without any obvious source of infection, even in immunocompetent individuals. It can mimic SEH clinico-radiologically, and should be considered as a possibility even in the absence of obvious signs of infection. Appropriate investigations including infection workup should be done in all patients of SEH, as fever is not a consistent finding in all patients of SEA. Prompt and correct diagnosis is essential as treatment for either, can be counterproductive in case of a misdiagnosis, in addition to the morbidity caused due to delay in instituting correct therapy.

## A close mimic of Potts's spine - Melioidosis, a case study

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**Introduction:** A spinal epidural abscess (SEA) is a rare condition that has a devastating impact on the patient's health. It is difficult to diagnose and can present with a myriad of symptoms with or without the involvement of a neurological deficit. The most common organisms isolated from the affected patient include *Staphylococcus aureus* and *Streptococcus* species while an abscess in some cases can be caused by tuberculosis and fungal and parasitic infections. Among the other causative organisms is *Burkholderia pseudomallei*, also known as *Pseudomonas pseudomallei*, which is a Gram-negative, bipolar, aerobic, motile, and rod-shaped bacterium. **Material and Methods:** A 28-year-old male presented with fever, back pain, and acute onset neurological deficit in both lower limbs. He is a known case of Chronic calcific pancreatitis with splenic vein thrombosis and multiple splenic abscesses. The MRI shows an anterior epidural abscess extending from L1 to L4. We have performed midline lumbar spine decompression by laminectomy of T12 -L4 and the pus culture shows *Burkholderia pseudomallei*. **Results:** Postoperatively, the neurological status of the patient gradually improved. IV antibiotics [ Imipenem + Aminoglycosides] given for 6 weeks. At 3 months follow-up, the patient was ambulatory without any external support. **Conclusion:** Though Southeast is not an endemic country for *Burkholderia pseudomallei*, this organism may cause SEA in immunocompromised patients.

## Spinopelvic dissociation in a U-shaped sacral fracture

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U-shaped sacral fractures are rare but unstable lesions and must be treated appropriately, to avoid progressive deformity and chronic pain. They are frequently associated with neurological deficits. A 52-year-old man, with thalassemia trait, Gilbert syndrome and alcohol abuse was admitted in the ER after a 3 meters fall. Neurological examination revealed complete motor function, paresthesia in S1 bilaterally and absence of saddle anesthesia. Lumbosacral and pelvic imaging showed fracture of right L2, L3, L4 and L5 transverse process, and U-shaped sacral fracture - Roy-Camille type III, with foraminal S1 involvement but without compromise of the sacral roots. Under fluoroscopy, a triangular construct was made. In dorsal decubitus a percutaneous two sacroiliac screws was performed. Then the patient was turned prone, through a midline incision the screws were placed in both pedicles of L4 and L5 and iliac. A crosslink was added to provide horizontal stability. The surgery was uneventful. During hospitalization, multifactorial anemia was managed with red blood cells transfusions and the patient was able to start walking with crutches, with pain control and reported improvement in paresthesias. In 7 months follow-up, the CT-Scan confirms a good consolidation of the fracture, the patient is able to walk without support, with mild pain and no paresthesia.



## Percutaneous vertebroplasty in osteoporotic fractures - our ten-year experience

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**Introduction:** Percutaneous vertebroplasty is a method of bone cement augmentation that is applied with the aim of reducing pain in patients with compression fractures of various etiologies

(osteoporotic, metastatic, traumatic), and also in patients with haemangioma. Material and

**Methods:** Study was conducted in a tertiary care institution in Serbia and included patients with an osteoporotic fracture, previously treated non-operatively. The diagnosis of osteoporotic fractures was established on the basis of CT or/and NMR diagnostics, and the fractures were classified according to the Osteoporotic Classification of thoraco-lumbar spine fractures (OF 1-5). The follow-up period was a minimum of six months, during which the patients consumed medical therapy for osteoporosis, and the Visual analog scale (VAS), Oswestry Disability Index (ODI), as well as the use of analgesis drugs were recorded. **Results:** The patients were between 65 and 85 years old. Most of the patients were female and most of the patients had bone density testing and diagnosed osteoporosis, with or without drug therapy. All patients underwent percutaneous vertebroplasty under analgosedation. Fractures were classified preoperatively, with OF2 being the most frequent fractures. Complications included minor venous bleeding and paravertebral bone cement leakage. They were monitored after two weeks, one month, three months and six months, with the largest number of patients recording a significant reduction in pain, as well as an improvement in the quality of life. **Conclusion:** Percutaneous vertebroplasty is, in our experience, a safe and effective method for pain relief and reducing drug use in patients with osteoporotic fractures.

## results of reconstruction of anterior column, fusion with stand alone cages in TB spine patients and complications related to cages.

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Study design: Retrospective and prospective case series.

Purpose: The aim of this study was to assess the results of reconstruction of anterior column, fusion with stand alone cages in TB spine patients and complications related to cages.

Methods: Study was carried out in patients with spinal tuberculosis/pott's disease. We assessed 1200 patients who were treated with cages with/without any other instrumentation. Radiographs were obtained before and after the surgery. Large number of patients followed on opd basis. A preoperative magnetic resonance imaging was obtained in every patient.

Results: 1200 patients with tuberculosis spine were followed in Ghurki teaching trust hospital. kyphotic angle correction was ,16.6% patients with 0-10 degree improvement, 60% patients with 11-20 degree improvement and 23.4% patients with 21-30 degree improvement. However after 3 years change in post surgical change in kyphotic angle is insignificant. Regarding the Frankel Scale in patients with neurological involvement ,47.49% patients show Frankel scale "E",22.61% patients showed Frankel scale "D" ,16.83% showed "C", 6.03% showed "B" while 7.04% patients showed no improvement after 3 years follow up.

Conclusions: The study shows that the vertebral body replacement after anterior corpectomy by reconstructive cages and bone graft provides a reconstruction of the anterior column, good correction of the mean kyphotic angle, effective biopsy of pathology ,drainage of pus and a correction maintained with cage without any cage related complication at long term follow up. The fusion can be achieved with reconstructive cage plus bone graft with or without posterior instrumentation.

## Clinical Outcome of lateral mass screws for traumatic sub-axial facet dislocation

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This study aimed to analyze the functional and neurological outcome of patients diagnosed with sub axial cervical spine bilateral facet dislocation managed by posterior midline approach and lateral mass screw fixation by Magerl technique. Material & Methods: We retrospectively evaluated 56 patients with traumatic cervical spine injuries who presented at Orthopedics and Spine Centre of Ghurki Trust Hospital, Lahore from March 2015 to October 2022. Patients included in this study have sub axial cervical spine bilateral facet dislocation managed by posterior midline approach and lateral mass screw fixation by Magerl technique. Functional outcomes were measure by neck disability index at last follow up. Pre and post op neurological status was evaluated with ASIA Score All the data were analyzed using SPSS version 26. Results: Total patients were 22, of which 75% were male and 25% female. Mean age was 39±17.02(13-70) years. Regarding level of dislocation, most common level was C5-6 which was involved in 12 patients, followed by C3-4 and C4-5 which was involved in 5 patients each. Pre-operatively according to ASIA score neurology was Grade E in 50% patients. 10 individuals (45.45%) maintained intact neurological function following the operation. However, 5 patients (22.73%) experienced a complete loss of neurological function, while 7 patients (31.82%) exhibited a partial loss of neurological function. Mean Neck Disability Index (NDI) was 21±19.44. Conclusion: After a good reduction, lateral mass screws are a secure and reliable approach for cervical fixation that not only stabilizes the cervical spine but also leads to patient's excellent functional recovery.

## Management strategy of Hangman's Fractures

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**Introduction:** Hangman's fractures are bilateral fractures of the C2 pars interarticularis produced during hyperextension injuries. They account for 4%–7% of all cervical spine fractures and 20%–22% of axis fractures. Their management remains controversial. The aim of our study is to list the therapeutic methods, their indications and their clinical and radiological results.  
**Material and Methods:** This is a retrospective study of patients treated for bipedicular C2 fractures in the between January 2015 and January 2022.  
**Results:** Our study included 16 patients. 6 patients had a type I fracture, 5 had a type II fracture and 5 had a type IIa fracture. 10 patients underwent orthopedic treatment and 6 patients underwent surgical treatment. The VAS went from 7 pre-op to 3 post-op for patients treated orthopedically and from 8 to 3 for patients treated surgically. Cervical spine mobility was preserved and no neurological complications were noted for the 2 types of treatment. Consolidation rate at 3 months was 90% for orthopedic treatment and 100% for surgical treatment.  
**Discussion:** Hangman's fracture results from a hyperextension injury of the neck. The evaluation of fracture stability based on the Effendi Levine/Edwards classification guides the choice between non operative and surgical treatment. Non-operative treatment should be reserved for Type I fractures, which are stable, in patients free of neurological abnormalities. The surgical treatment of hangman's fractures indicated in type II and type III fractures.  
**Conclusion:** Orthopedic and surgical treatment are 2 effective technics in the management of Hangman's Fractures. The choice of one or other technique is based on Effendi Levine/Edwards classification.

## Superior Gluteal Artery Injury During Open Sacroiliac Joint Fusion: A Case Series

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**Introduction:** As use of both open and minimally invasive (MI) sacroiliac joint (SIJ) arthrodesis increases amongst spine surgeons, multiple studies have sought to better understand the outcomes, complications, and costs associated with surgical SIJ fusion for this procedure. Little has been published on superior gluteal artery (SGA) injury during the open surgical technique. We are reporting three cases of SGA injury during SIJ arthrodesis using triangular rod implants. The purpose of this report is to describe how iatrogenic injury to the SGA can occur during SIJ fusion and provide a detailed algorithm to help guide surgeons in decision making when an injury to the vasculature around the SIJ is suspected. **Methods:** For this case series, we retrospectively analyzed three patient's demographic, clinical, and surgical data using the electronic medical record. This involved reviewing notes from pre- and post-operative encounters, imaging, and the intraoperative imaging from both the SIJ fusion procedures and subsequent IR embolization procedures that followed. **Results:** Our report details demographic and surgical factors of three cases involving injury to the SGA during SIJ arthrodesis. Based on these cases, we have developed and present an algorithm to guide decision making if this injury is suspected. **Conclusion:** Injury to the superior gluteal artery is a serious, although uncommonly reported, risk of SI joint arthrodesis. Significant perioperative morbidity may surround injury to the superior gluteal artery. We describe three cases of this uncommon injury including operative techniques, interventions after the injury, and propose a treatment algorithm when this injury occurs.

## Migration Of K-Wire From Acromioclavicular Joint To Cervical Spinal Canal: A Case Report With Minimally Invasive Removal Technique and Literature Review

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Kirshner wires, or K-wires, are frequently used to treat shoulder injuries, especially those involving the acromioclavicular joint. They stabilize bone fragments in a minimally intrusive, cost-effective, and adaptable manner. K-wires, however, occasionally move from the clavicle to the surrounding tissues, especially the area around the cervical spine. We report the case of a 60-year-old female patient who had radiation to her left upper limb and left-sided neck pain. A K-wire from the acromioclavicular fixation traveled in a horizontal trajectory, through the left C7-T1 foramina, and into the cervical spinal canal. The K-wire was minimal-invasively removed from the patient, and following the procedure, discomfort decreased without any neurological side effects. Kirshner wires are commonly used, yet there is still concern about their migration to unexpected anatomical areas. With the help of this case, we discuss the clinical presentation, diagnostic techniques, and surgical strategies in this case that are connected to K-wire spinal canal migration. In the shoulder region, plate fixation techniques are preferable over K-wire fixation. If not, the wires must be removed as early as possible to prevent issues related to migration. Although it happens seldom, migration into the spinal canal has been more frequently documented recently. It is preferred to remove the K-wire, even in asymptomatic patients. To rule out involvement of the spinal or vertebral arteries, CT angiography is necessary. After thorough investigations, minimally invasive longitudinal removal is safe. A combined posterior and lateral approach may be required in cases of neurologic involvement.

## Conservative treatment of rivaroxaban-induced spontaneous epidural haematoma - review of the literature and case report

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Spontaneous spinal epidural haematomas are exceptionally rare clinical entities that may progress rapidly and cause permanent neurological injury. Symptoms usually depend on the location of the haematoma, levels involved, and haematoma size. Pathophysiology often includes coagulopathy and/or over-anticoagulation. Epidural haematomas are generally considered a surgical emergency where immediate decompression is warranted, especially in the setting of neurological deterioration and palsy. In a select group of patients, initial conservative treatment may be appropriate. We present a case of a 68-year-old patient who was referred from another hospital for epidural haematoma C1-Th4 with transitory tetraplegia ASIA A. She initially presented with an intermittently resolved and worsening neurological exam. The patient received long-term oral rivaroxaban therapy and had no history of trauma. A review of the literature revealed 8 cases of spontaneous spinal epidural haematoma while on rivaroxaban. The status during admission revealed tetraplegia ASIA D. Considering technical difficulties and morbidity of C1-TH4 decompression, we opted for an initial conservative approach. The patient was placed in a semi-seated position and a careful trial of gravity-assisted reduction of the epidural haematoma was initiated. Serial neurological exams were performed every 30 minutes to 1 hour. Subsequently, she recovered neurologically and her control MRI demonstrated haematoma reduction. The prerequisite for conservative treatment is having adequate surgical resources in the event of neurological deterioration and persistence of deficit. The patient was discharged after 6 days and was discharged ambulatory. Follow-up after 3 months revealed mild sensory loss in fingers with intermittent neck pain and right hand pain.

## Robotic assisted Posterior Vertebral Cement augmentation

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**Introduction:** Balloon Kyphoplasty and Vertebroplasty have been conventionally performed percutaneously under fluoroscopic guidance with satisfactory results. However, these procedures are more challenging in those patients with spinal deformities, higher BMI, severe osteoporosis, high-grade collapse such as vertebra plana due to altered anatomy and poor visualization. **Methods:** Thirty-four patients with 46 vertebral compression fractures who underwent robotic assisted Balloon Kyphoplasty with the “scan and plan” workflow were included in the study. We did not use a bone mount in any of the cases as we felt there wasn’t significant movement of the patient during the procedure. The O-arm time, Robot time, and mean radiation exposure were noted. Post-operative O-arm scans were done to determine if there was any cement leak. **Results:** The most cranial vertebra was T6 and the most caudal vertebra was S1. The mean O-arm time was 4.1 minutes, the mean robot registration time was 4.7 minutes and the mean time per trajectory was 1.2 minutes. The mean radiation dose to the patient was 27.1 mGy. None of the patients had any cement leak into the canal on the post-operative O-arm scan. The mean time to mobilization post procedure was 114 minutes. **Conclusion:** Robotic assisted drilling of trajectories for insertion of Kyphoplasty Balloons is accurate and this reduces the risk of cement leaking into the canal, in cases where visualization of the pedicle is challenging like high BMI, severe osteoporosis, vertebra plana, and spinal deformity.



## Preoperative planning with 3D navigation software increases lateral mass screw insertion accuracy for open cervical spinal surgeries

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**Introduction.** In contemporary cervical spine surgery, technological advancements play a pivotal role. This study aims to assess the accuracy of lateral mass screw (LMS) insertion, comparing LMSs inserted with/without preoperative navigation, alongside evaluating outcomes and complication rates. **Methods.** A scoring system for LMS placement accuracy with Magerl technique was devised, considering four key aspects: entry point, axial angle, sagittal angle, and bicorticality. We examined 24 patients (mean age 54 years) who underwent posterior cervical spine fusion using 111 LMSs in the C3-C6 range between 2006 and 2023. Two authors assessed each parameter, utilizing CT scans at 1-week postoperatively. Patients in the navigation group underwent preoperative planning using the Stryker Orthomap 3D Navigation System. Accuracy was defined as optimal or suboptimal screw positioning. **Results.** The average LMS length was 14.3 mm. The average axial and sagittal angles were 23.3° and 12.2°, respectively. Sixty-eight were planned with navigation and 43 free-hand. Of the 111 screws analyzed, 52 exhibited optimal positioning, while 59 showed suboptimal positioning. Notably, 88.67% of optimally positioned screws were placed using navigation, whereas 86% of screws with suboptimal positioning were inserted using the free-hand technique. The screw accuracy rate was significantly higher in navigated group (Chi squared 31,841,  $P < 0.0001$ ). At a mean of 10 months, we found wound dehiscence (3), screw loosening (1) and pulmonary embolism (1). **Conclusions.** the scoring system employed seems adequate and reproducible for evaluating screw positioning. Preoperative navigation software resulted in over 80% of LMSs being optimally placed, thus enhancing the accuracy of LMS positioning.

To study the prevalence of posterior ligament complex injury in traumatic thoracolumbar burst fractures.

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**Aims and objectives** – To study the prevalence of posterior ligament complex injury in thoracolumbar burst fractures and correlation of neurological status with MRI proven PLC injury and correlation of CT and MRI findings for assessment of PLC injuries in thoracolumbar burst fractures

**Method** Patients with thoracolumbar fractures were subjected to Computed tomography scans to determine the thoracolumbar burst fracture and to look for posterior ligament complex injury. MRI was done within a week of presentation to document the posterior ligament complex injury. Findings of both CT as well as MRI were evaluated and documented. Patients requiring surgery were admitted to JPNAPC, AIIMS New Delhi. Patients treated conservatively were followed up on OPD basis.

**Results** 32 patients with thoracolumbar burst fracture were included in this study. All the patients underwent a CT scan of the spine on the day of presentation and MRI of the spine was done within 7 days of the injury. Prevalence of posterior ligament complex injury was found to be 53.1 percent. A total of 11 patients had a neurological deficit in our cohort of 32 patients. 10 out of these patients with neurological deficit had MRI-proven PLC injury. Seven of the 21 patients with intact neurology had PLC injury on MRI scan. Two or more CT findings positive for PLC injury prediction, have a higher specificity (93.3%) of diagnosing PLC when comparing with MRI scan as gold standard.

**Conclusion** Prevalence of posterior ligament complex (PLC) injury (53.1 %) is high in traumatic thoracolumbar burst fractures.

## Comparison the effect of Navigated and Non-Navigated on vertebral body screw placement in anterior approach surgery for treatment of thoracolumbar burst fractures : a randomized controlled trial

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**Objectives:** To evaluate the effect on vertebral body screw placement of navigation technique in anterior approach surgery for treatment of thoracolumbar burst fractures. **Methods:** A prospective study was conducted on patients undergoing anterior approach thoracolumbar surgery in our hospital from May 2018 to August 2019. The 40 patients were randomly divided into Navigation Group and Control Group. In the Navigation Group, vertebral body screw placement was performed under 2D navigation technique; in the Control Group, no navigation was utilized. Clinical and radiological evaluations of the two groups were compared preoperatively and immediately after surgery. The paired t-tests and Chi-square test were used to evaluate clinical and radiological indicators. **Results:** There was no difference in hospital stay, operation time, autologous blood recovery, postoperative drainage volume, Cobb Angle of the preoperative coronal plane, sagittal plane, postoperative sagittal plane, Cobb Angle of coronal plane and sagittal plane before and after surgery measurements on X-ray and CT images between the two groups ( $P>0.05$ ). The correction of kyphosis deformity of fracture segment was better in both groups ( $P<0.001$ ). The intraoperative blood loss and the Cobb Angle of the postoperative coronal plane in Navigation Group was less than that in Control Group ( $P<0.05$ ), and the four vertebral body screws in Navigation Group were more parallel to the endplate than those in Control Group. **Conclusion:** Navigation technology can improve the accuracy of screw placement in anterior approach surgery for treatment of thoracolumbar burst fractures, which can be effectively applied in anterior approach surgery of thoracolumbar fractures.

## Postoperative Outcomes of Balloon Kyphoplasty (BKP) and Vertebral Body Stenting (VBS) for Osteoporotic Vertebral Fractures (OVFs) with Predictors of Poor Prognosis

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**Purpose:** This study aimed to assess the outcomes of balloon kyphoplasty (BKP) and vertebral body stenting (VBS) in OVF cases with predictors of poor postoperative results. **Methods:** 50 consecutive patients with OVF (VBS;25, BKP;25) between January 2021 and July 2023 were included. Patients had at least four out of five reported poor postoperative outcome factors: thoracolumbar junction, disease duration  $\geq 30$  days, existing vertebral fracture, vertebral instability, and focal kyphosis. **Primary endpoints** were postoperative back pain using the Numeric Rating Scale (NRS) and the occurrence of new vertebral fractures. **Secondary endpoints** included cement leakage, wedge angles, and local kyphosis angles. **Results:** Both groups showed significant improvement in NRS (VBS: preoperative 6.8, 3-month postoperative 1.1; BKP: preoperative 6.7, 3-month postoperative 2.9), with the VBS group demonstrating significantly better outcomes. New vertebral fractures occurred less frequently in the VBS group (8% vs. 28%), although the difference was insignificant. Wedge angle significantly improved in the VBS group (preoperative 18.1 degrees, 3-month postoperative 9.4 degrees). No significant differences were observed in cement leakage, wedge angle, focal kyphosis angle, or wedge angle change at 1 week and 3 months postoperatively between the two groups. Still, there was a difference in kyphosis angle change (5.1 degrees in VBS vs. 0.4 degrees in BKP) significantly. **Conclusion:** In cases of vertebral fractures with multiple factors contributing to poor postoperative outcomes, VBS may be more effective than BKP alone in reducing the incidence of new vertebral fractures and potentially obviating the need for posterior fixation.

## Evaluation of functional outcome of posterior short segment fixation with implanting pedicle screw in the fractured level for treatment of recent traumatic thoracolumbar burst fracture in Spine - A Prospective Study

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**Introduction:**The thoracolumbar spine is vulnerable to fracture in falls or RTA in developing nations like India. Thoracolumbar spine fracture can be associated with neurological deficits, long-term pain and disability. The optimal management for these injuries remains a considerable subject for research. **Objectives:**To evaluate short term functional outcome of posterior short segment fixation with implanting pedicle screw in the fractured level for treatment of recent traumatic thoracolumbar burst fracture. **Methods:**This prospective study included 30 patients with radiologically & clinically confirmed thoracolumbar burst fracture. Patients were evaluated preoperatively, at time of discharge, and at follow-up visit after 3 months and 6 months clinically using the Low-Back Outcome Scale of Greenough and Fraser Score, the American Spinal Injury Association (ASIA) for neurological evaluation, and the AO fracture classification for injury severity evaluation. Radiological evaluation included calculation of the sagittal index (SI) of injured vertebral body, anterior body compression (ABC) according to Mumford's equation, and regional kyphosis using Cobb angle. All patients underwent posterior trans-pedicular screw insertions into a vertebral body one level above and below the fracture site, and an additional pedicle screw was inserted at the level of the fracture. Postoperative clinical and radiological evaluations were compared to the preoperative. **Results:** Wound infection was encountered in five patients and responded to conservative treatment. After 6 months, mean low back pain scores were significantly higher than preoperative and early postoperative scores and frequency of patients with excellent good postoperative status was significantly higher at early postoperative evaluation. None of the patients had neurological deficit.

## Neurological deficits caused by cement extravasation following vertebroplasty: a case report

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Neurological deficits secondary to percutaneous vertebroplasty caused by cement leakage is a rare condition. Although cement extravasation during percutaneous vertebroplasty is not uncommon, most cases are clinically asymptomatic, and symptomatic cement extravasation that requires surgical excision is rarely reported. Herein, a case of radiculopathy secondary to cement leakage is reported. A 70 years old woman suffered from a severe back pain after a benign trauma. Plain radiographs and CT revealed a vertebral compression fracture. Conservative treatment including bed rest, analgesic medication and bracing for approximately two weeks did not reduce the local pain, and vertebroplasty was performed in a radiology department.

The woman was discharged and she returned to her normal activities. She presented to our clinic one month later with exacerbation of pain, a motor deficit (muscle strength grade 3) and hypoaesthesia of the lower extremities.

CT scan revealed a cement leakage to the left L2-L3 foramen and we decided to perform a surgical treatment. A posterior decompression was performed with L2-L4 fixation. Following surgery, the patient's pain improved immediately, and his muscle strength increased gradually. The patient was discharged after 3 days. After 1 month, his neurological deficits had normalized. At the 6-month follow-up, the patient was pain-free without any neurological deficits.

Spinal canal stenosis as a complication following vertebroplasty has been described by various authors and is most likely after cement leakage into spinal canal or cement dislodgement. Medical practitioners need also to remember that neurological complications do not always manifest immediately after the procedure.

## A study of new vertebral body fractures occurring after spinal fixation for osteoporotic vertebral fracture

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**Purpose:** We investigated the incidence of new vertebral body fractures after spinal fixation for osteoporotic vertebral fracture. **Methods:** Fifty-eight patients underwent spinal fixation for osteoporotic vertebral fracture from January 2007 and were followed up for at least 6 months. The mean age was 79 years and the mean follow-up was 20.8 months. We investigated the presence of new postoperative fractures, the time of occurrence, and the extent of fixation. **Results:** New postoperative fractures were observed in 23 patients, 10 at UIV, 2 at LIV, 7 at fixed adjacent vertebrae, and 4 at other remote sites. Fractures occurred after an average of 1.02 months for UIV and LIV, and after an average of 22.5 months for the other sites, showing a significant difference in the two groups. 7 out of 22 patients with long fusion (>5 vertebrae) and 16 out of 36 patients with short fusion (<4 vertebrae) had new vertebral fractures, and there was no difference in incidence. **Discussion:** UIV or LIV fractures occurred within 1 month after surgery in 11 out of 12 patients, while fractures of adjacent vertebrae and remote sites occurred within 1 month in only 1 out of 11 patients. This suggests that UIV or LIV fractures may have occurred early due to stress concentrations in the UIV/LIV as a result of fixation. On the other hand, fractures of fixed adjacent vertebrae and remote sites tend to occur later after surgery, suggesting that osteoporotic vertebrae may have fractured during the natural history of the disease.

## Clinical And Nosological Characteristics of Mine-Explosive Injuries in Victims of Modern Combat Actions in Ukraine

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The study of the clinical and nosological characteristics of a mine-explosive injury will allow predicting the course of the traumatic process in the injured, which will allow to increase the level of treatment of victims of this category. Most often, the main dominant injury in victims with mine-explosive injuries is a skeletal injury in 40.2% of cases. Among skeletal injuries, mine-explosive leg injury was recorded in 39.6% of cases. Victims with a dominant thoracic injury were identified in 19.6% of cases. In 17.7% of victims with a mine-explosive injury, cranial injury was dominant. Wounded with a predominant abdominal injury were found in 15.0% of cases. a dominant injury of the extraperitoneal space was diagnosed in 7.5% of victims. The most common dominant injury in mine-blast injury victims is a skeletal injury, and the main stage of medical care is the stage of highly specialized medical care. The main stage of providing medical care to victims with dominant thoracic and abdominal injuries is the stage of qualified medical care, where the most of them are registered. The main stage for victims with a dominant craniocerebral injury is the stage of specialized medical care, where they concentrated the most.



## Implementation of diagnostic assessment systems as indication to limb amputations in civilian patients with injuries due to modern military operations

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Implementation of diagnostic assessment systems as indication to limb amputations in civilian patients with injuries due to modern military operations

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Introduction: definite objective standardized criteria for limb damage as a basis for determining indications for amputation in victims of modern military operations in the early stages of medical care. Materials and methods. The total number of 2122 casualties civilian patients with injuries as a result of modern military hostilities in eastern Ukraine as a result of the anti-terrorist operation (ATO) for the period May 2014 - December 2016, before of the Great War In Ukraine, of which 1069 were with damaged limbs, was studied and analyzed. Results. The need for limb amputation arises in patients with an assessment score on proposed scale of more than 20 points, and this depends on the clinical anatomical signs of damage. So, the highest risk of amputations is the damage to the forearm – 62%, injured to more than 30 points - damage to the lower shin - 41.18% and damage to the foot - 42.86%, that is, the distal limbs. Conclusion. When interpreting the assessment of the need for amputation, the principle of saving the life of the injured rather than the injured limb has a hierarchical priority. The use of combined, standardized assessment systems is justified.

## Clinical effective risks of mortality in road traffic injury victims depending on the severity of damage

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The problem of the relationship between mortality and severity of damage in road traffic injuries is one of the most important in road traffic injuries as a whole. An analysis of 1,696 cases of road traffic injury was carried out, the standardized New Injury Severity Score (NISS) assessment system was applied, and a probable but indirect dependence of the clinical outcome risk of the occurrence of a negative course of the traumatic process in road traffic injury victims from the severity of damage was established. It was established that the sign of participation in traffic affects the formation of clinical effective risks of the occurrence of a negative result of the course of the traumatic process in the victims, starting with the severity of damage according to the NISS of 25 points. With the same qualitative characteristics, pedestrians have the highest risk of fatality, drivers have the lowest risk.. All results are probable according to the criteria and requirements of the evidence-based medicine. Conclusions. 1. The risk of a fatal road traffic injury in general directly depends on the severity of the damage to the victim, although the dependence is not direct. 3. Pedestrians have the highest risk of mortality as a result of a traffic accident with the same qualitative characteristics of the clinical outcome risk, drivers have the lowest. 4. The clinical and anatomical form of damage together with the severity of the damage have a synergistic effect on the formation of the clinical effective risk of

## Damage to the civilian population as a result of hostilities in Ukraine (anatomical structure of damage)

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Introduction: the trauma of the civilian population as a result of modern hostilities is an important and unsolved problem of modern medicine. Methods: more than 5,000 cases of injury to civilians who were damaged as a result of hostilities in Ukraine and did not take direct part were studied and analyzed. The anatomical structure of the damage was verified. Results: it was found that the following injuries prevail: lower limbs - 67.5%, upper limbs - 17.8%, pelvis - 12.4%, spine - 5.1%, abdominal trauma 12.6%, thoracic trauma - 11.8 %, cranial trauma - 12.6%. Damage to more than one location occurs in 56% of victims, the combination ratio is 1.39. Injuries in two locations are most common (61.2%), a combination of thoracic and abdominal injuries, upper extremity and thoracic injuries, lower extremity and pelvis injuries, spine and thoracic injuries, and a combination of thoracic and cranial injuries are characteristic. This list is given with a sign of a decrease in specific weight. Injuries of three localizations were found in 25.2%, the most characteristic were a combination of injuries of the lower limb, abdominal and thoracic injuries; injuries to the lower limb, pelvis and abdominal injuries; thoracic, cranial and vertebral injuries; thoracic, abdominal and vertebral injuries. Injuries of four localizations were found in 10.2% of cases, the most characteristic being a combination of lower limb injuries, thoracic and abdominal injuries, pelvic injuries; spine injuries, cranial and thoracic injuries, upper extremity injuries. Damage of four or more localizations occurred in 3.4% of cases.

## Timing of fasciotomy and evaluation of critical limb ischemia in patients injured in the 2023 Türkiye Maraş Earthquake

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**Aim:** The aim of this study is to examine the treatment management and demographic data of earthquake victims who applied to the 3rd Level treatment center within the first 24 hours after the 2023 Kahramanmaraş earthquake. **Materials and Methods:** The data of a total of 120 patients (65 men, 55 women) who applied on February 7, 2023 were examined retrospectively. Injury characteristics of the patients, rescue time, fasciotomy timing and amputation rates were evaluated. **Results:** The mean age of the patients was 36.3 years ( $\pm 17.3$  years; range 85-88 years). The average time for patients to be rescued from the debris was 6 hours (min 3, max 16). The extremity injuries of the patients were in the thigh (n: 20), lower leg (n: 25), foot (n: 10), arm (n: 11), forearm (n: 20), hand (n: 15). The number of patients with pelvic and abdominal area injuries was 2 (2%). Fasciotomy was performed on 75 patients trapped under the rubble. Acute amputation was performed in 4 patients (3 in the lower extremity and 1 in the upper extremity). Perioperative laboratory values of the patients were closely monitored to prevent the development of crush syndrome. 20% of the patients (n:24) were treated conservatively. **Conclusion:** Appropriate triage, appropriate fasciotomy and appropriate surgical interventions provide clinically satisfactory results by reducing the amputation rate.

**Key words:** Maraş earthquake, fasciotomy, amputation

## A prospective study evaluating the adequacy of Application of below Knee Plaster following Ankle Injuries.

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**Background:** Some problems were noted with below knee plasters application causing non-functional positions and improper reduction after manipulation. Guidance for the application of casts is discussed in detail in the British Orthopaedic Association Casting Standards, with the technique advocated by Gwozdz and Bakody recommended. The ankle joint should be adequately reduced and immobilised in a neutral position (i.e. with the foot at 90° to the leg). **Methods:** Retrospective study including 49 patients with Ankle Injuries that needed Below Knee Plaster. The outcome measures selected for study were; Ankle 'neutrality' (i.e. degree of plantar/dorsiflexion from neutral) assessed on the lateral radiograph by measuring the axis of the fibula against the axis of the fifth metatarsal, Adequacy of ankle reduction and whether or not casts had to be reapplied. **Results:** Baseline data collection was performed retrospectively over a 3-months period. The mean ankle position was 118° plantarflexion (PF) with 13.33 degree standard deviation (ranged between 93° to 167°). The ankle reduction was adequate 28 cases (57.2%) inadequate 21 cases (42.8%). Twelve patients (25%) required plaster re-application. One Plaster required further reapplication. The mean ankle position was 116° plantarflexion (PF) with 10 degree standard deviation (ranged between 99° to 128°). The Reduction after plaster reapplication adequate in 5 patients and inadequate in 7 patients. Out of the 49 Cases; 15 cases needed urgent Surgery. **Conclusion:** This study emphasizes the importance of adequate ankle reduction with plaster application in neutral position to reduce number of ankle re-manipulation and soft tissue complications.

## A prospective study evaluating the outcomes of suprapatellar nailing of proximal tibial shaft fractures.

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**Background:** Tibial shaft fractures represent the most common long bone fractures. Intramedullary nailing has been the standard procedure for surgical treatment of tibial shaft fractures, allowing for minimally invasive fixation and preservation of the extraosseous blood supply, and has the advantages of early mobilization, high union rates and few wound complications. **Methods:** a prospective study including 20 patients diagnosed with closed proximal tibial shaft fractures and treated with intramedullary nailing from the suprapatellar approach. All patients had been admitted from July 2020 to January 2021 and were followed-up for one year. **Results:** At the end of follow-up, all the fractures had united. The average union time was less than 6 months in 13 patients (65 %), and more than 6 months in 7 patients (35%). 17 patients (85%) had no anterior knee pain, 2 patients (10%) had pain while walking, and one patient experienced mild pain on walking and at rest (5%). All patients had a full knee extension, Eleven patients (55%) had full knee ROM, seven patients (35%) could flex up to 125 degrees and two patients (10%) up to 110 degrees. Clinical outcomes, according to the Hospital for Special Surgery Knee Rating Scale, were excellent in eight patients (40%), good in nine patients (45%), and fair in three patients (15%). 14 patients (70%) returned to pre-fracture activity and 6 patients (30%) did not return to pre-fracture activity. **Conclusion:** This study emphasizes the safe use of the suprapatellar approach for nailing of proximal tibial shaft fractures.

## Comparison of anterior thigh pain, radiological union and functional outcome in short versus long proximal femoral nail in patients of inter-trochanteric fracture - a cross sectional analytical study

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**Introduction:** - Proximal femoral nail was designed for unstable trochanteric fractures. Short nails offer shorter operative times, reduced blood loss, and lower transfusion rates. Long nails protect the femur, particularly in elderly osteoporotic patients. A common complaint with CMNs is anterior thigh pain. We compared short and long PFNAs based on anterior thigh pain. We also compared them based on fracture union time and any loss in reduction 6 months post-surgery and functional outcome.

**Materials and Method:** - This was a cross-sectional analytical study with hundred patients divided into two groups. Inclusions criteria-all skeletally mature patients with inter-trochanteric fracture treated within three weeks of fracture. Exclusion Criteria-compound fractures, Patients with neglected inter-trochanteric fractures, fracture non-union and mal-union, pathological fractures, fracture greater than 3 weeks old and polytrauma patients. At 6 months, X-rays were obtained. Signs of union was assessed and union time recorded. Anterior thigh pain was compared using the Visual Analogue scale. Hip function was assessed using the Harris Hip Score.

**Results:** - There was significantly shorter operating times in Group-1 compared to Group-2. At 6-months, Group-1 had a higher incidence of anterior thigh pain. No significant difference in hip function as assessed by the Harris Hip Score. Fracture union rates were comparable between the groups.

**Conclusion:** - Long nails cause less thigh pain compared to short PFNs, especially in patients with osteoporosis. However, it suggests the need for further randomized trials with larger sample sizes and longer follow-up periods to validate these findings.

No conflict of Interest.

## Functional results of Dual Plating of communitied distal femur fractures using modified swashbuckler approach- a series of 10 cases.

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introduction: communitied fractures of distal femur pose a challenge to the surgeon in getting a stable fixation as well as getting good functional results.here we present our results of a small series of such fractures treated by modified swashbuckler approach.Aim:to analyse the functional results of communitied distal femur fractures treated by modified swashbuckler approach.methods:a series of communitied distal femur fractures that presented to our department over the last two years which underwent surgical fixation were included in the study.open fractures were excluded.so were cases with polytrauma. patients age group ranged from 28 years to 65 years.all cases were operated by a single surgeon.a midline skin incision was used to expose . the quadriceps apparatus was elevated laterally and medially in a sequential manner to visualise the whole of distal femur.the deeper incision was extended to either side of patella leaving a soft tissue of about one centimetre. periosteal stripping was restricted to the minimum necessary to align the fragments.fixed laterally and medially with corresponding plates.bone graft was used to fill the metaphyseal voids.closed in layers after achieving heamostasis. a plaster of paris above knee slab was given post operatively.post op care:above knee plaster cast for six weeks followed by intial non weight bearing mobilisation.results:results are analysed using knee society score.in our limited series , we find that this method of fixation is a reliable option for such serious injuries.



## Infective non-union of the distal third tibia with vascular insufficiency treated with limb reconstruction system: a case report.

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**Introduction:** Infective non-union of the distal tibia is a difficult condition that needs multiple surgeries. The distal tibia is less vascular and at increased risk of non-union. Usual treatments for this include Ilizarov and limb reconstruction system (LRS). LRS is less cumbersome and easy to maintain compared to Ilizarov fixation. Ilizarov has the advantage of multiplanar correction even in the postoperative period. There are no studies to our knowledge of the outcomes in cases of vascular insufficiency. **Case report:** We present a patient with infected non-union of osteoporotic distal tibia, with vascular insufficiency of anterior and posterior tibial vessels. The patient was initially treated elsewhere and presented to us after multiple surgeries, failed LRS, osteoporotic distal tibia with large bone defects in the distal tibia with persistent purulent discharge. CT angiography was done to see vascular status- arteries were noted to have a tortuous course, calcified, and attenuated flow. We decided to do LRS with distal pins having transfibular screws to gain stability. Given the precarious vascularity, biplanar pins were avoided in favor of Shanz pins with Transfibular purchase in the distal segment. Thorough debridement, bone transport, and distal docking were done. The patient can bear weight and walk which was not possible before the surgery. **Discussion and conclusion:** Ilizarov is a difficult procedure but offers more versatile corrections in multiple planes. Given versatility, Ilizarov is commonly recommended. However, LRS remains a viable option in cases of vascular insufficiency to reduce the chances of unintended vascular injury.

## Locking plates as an external fixator to treat tibial fractures - case studies of first experiences

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Good clinical outcomes for locking plates as an external fixator to treat tibial fractures, non-union or bone infection have been reported. However, external locking plate fixation is still generally rarely performed. Evidence concerning the biomechanical characteristics of external locking plate fixation is still inadequate to support its clinical recommendations as an external locking plate. Ideal osteosynthesis involves the optimal balance between biology and mechanics that promotes fracture healing. The concept of biological fracture fixation implies preserving soft tissue and periosteal blood supply and achieving relative stability that promotes callus formation. Internal locking plate fixation can be too stiff to promote optimal fracture healing by callus formation or can cause inconsistent and asymmetric formation of the periosteal callus. Some authors introduced a modified internal locked plating technology, termed "far cortical locking," In this technology, elastic fixation is achieved through cantilevered bending of the far cortical locking screw shafts. The mechanism is similar to an external fixator that derives elasticity from fixation pin flexion. External locking plate fixation requires the placement of the plate as close as possible to the skin, which allows low-profile design because the increased distance of the plate from bone can be too flexible for bone healing. We presented sixth patients after treatment tibial fracture, nonunion or bone infection with locking plates as an external fixator. All patients showed radiological signs of healing in the range of 16-24 weeks. Further biomechanical and clinical analysis is necessary to evaluate the effect of external locking plate fixation on fracture healing.

## Open leg fracture Complicated by endogenous endophthalmitis about a case

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**Introduction:** Endogenous endophthalmitis is an intraocular infection related to the intraocular penetration of germs by hematogenic route . It is less common than exogenous endophthalmitis and represents about 2 to 6% of all endophthalmities. **Methods:** This is the medical observation of a 57-year-old patient who has a history of chronic smoking, poorly balanced diabetes, and having presented following an accident of the public road an open fracture of the leg with a delay between the admission and the trauma which exceeds ten hours which increases the infectious risk. **Results:** The clinical examination of the leg objectified a wound of 15 cm with ecchymotic banks stained with deep tar classified type two of cauchoix and Duparc, opposite a large bone fragment exteriorized through the wound, without vasculo nervous deficit. Parage was made in the operating room with an external Hoffman type 2 fixation. An eye examination was done which objectified acute endophthalmitis

The patient was placed on systemic treatment combining ciprofloxacin and ceftriaxone, as well as treatment with intravitreal ceftazidime injections. **Discussion:** Endogenous endophthalmitis are severe infections secondary to hematogenic intraocular seeding of a microorganism from a septic focus, mainly gastrointestinal, genitourinary or cardiac. This infection can affect only one eye or both, the involvement of the second eye can occur simultaneously or remotely. **Conclusion:** Endogenous endophthalmitis seems to be able to complicate any type of skin infection accompanied by bacteremia. Diagnostic management and rapid treatment will be necessary to avoid ocular and general complications potentially blinding or lethal.

## A case report of a chronic “false joint” near the knee

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We present a case of a 50-year-old man with a past history of heavy alcohol and tobacco abuse who suffered a car accident which led to an exposed distal fracture of the left femur, Grade IIIA of Gustillo Anderson, AO/OTA 33C2.3 and a fracture of the left patella AO/OTA 34C1.2. He was immediately taken to the operating room and he underwent open irrigation and debridement of the wound and the distal femur fracture was treated with retrograde nail fixation and the patella with two lag screws. During the postoperative period, the patient left the hospital against medical orders and reappeared in the outpatient clinic 3 years later, with gait claudication, pain and he was unable to put almost any weight on the left leg. The X-ray revealed pseudoarthrosis of the distal femur fracture. He was subsequently taken again to the operating theater and he was submitted to debridement of the pseudoarthrosis, removal of the nail and osteosynthesis of the fracture with two distal plates of the femur (internal and external) . Due to the fact that he had a huge bone defect in that area, it was necessary to use bone graft (autograft and allograft). In the last visit, one year later, the x-rays showed full consolidation of the fracture and the patient’s gait was improved. He had no pain and no lameness and he regained full control of his life again.

## The role of accurate diagnosis of the damaged ligament of the foot during the 24-hour "window" from the moment of trauma to the complete recovery of the injured ligaments - case report

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Introduction: In phase 1- the inflammatory phase of tendon healing after an injury, the blood clot, activates the release of chemoattractants and serves as a scaffold for invading cells, including neutrophils, monocytes and lymphocytes, which migrate from the surrounding tissue to the site of injury where necrotic debris is digested by phagocytosis. Applying the technique of central lymphatic drainage to ensure the undisturbed movement of the mentioned "participants", as well as the liquid may accelerate recovery process.

Aim: To show a case where precise manual diagnosis of damaged ligaments, as well as an equally precise treatment consisting of central lymphatic drainage has a favorable effect on the recovery of the injured ligament.

Methods: Patient was examined on 18/10/2018 for a distortion of the right ankle and foot. He previously underwent orthopedic examination and X-ray imaging. During a manual examination of lig. lateralis fibers, lig. calcaneocuboideum plantare, lig. cuboideonaviculare plantare, lig. cuneocuboideum plantare, lig. cuneonavicularioplantare localized of the problem, and took advantage of the 24-hour window. By applying central lymphatic drainage, the swelling that occurred during the injury as well as the detritus were evacuated.

Results: After 2 months, a thin palpation confirmed the complete restoration of the original length of the treated ligaments, which was confirmed by an ultrasound examination.

Conclusion: central lymphatic drainage if applied in the 24-hour "window" of the acute phase of the injury reduces swelling and inflammation, and activates regulatory immune mechanisms, which promote complete repair.

Key words: central lymphatic drainage, 24-hour "window" of tendon healing

## Treatment of diaphyseal femur fractures using a tibial nail in retrograde fashion. A Case series.

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**Introduction:** This retrospective study was conducted in Quito, Ecuador in a single center. Due to implant availability, the authors chose to treat eligible femoral shaft fractures with a tibial nail in a retrograde fashion with its curvature set backwards. Retrograde femur nails are scarce and expensive in Ecuador. **Methods:** A retrospective study of 18 patients between January 2021 and December 2022 was performed. We followed the standard indications for retrograde femoral nailing. **Surgical technique:** Nailing was performed using a retrograde nail technique. Nails used were at least 10mm diameter and long enough to reach lower trochanter. Two or three locking distal screws and one or two proximal were inserted. **Results:** 18 of 18 patients achieved full consolidation. 1 patient with articular fracture had screw loosening after six months. Patients reported an average of 8 in Tegner activity scale and resumed regular activities within 4.5 months. **Conclusion:** This technique can be safely used in developing countries and get good functional results. The usage of tibial nails in femur shaft fractures has been reported before. Authors do not encourage the usage of this technique if retrograde nails are available, however, it can be a surgical technique that helps treat patients in lower income countries.

## Length Of Hospital Stay And Survival Post-Distal Femoral Fractures: Assessing Distal Femoral Replacement And Internal Fixation Procedures In The Elderly

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### Background

Distal femoral fractures significantly impact patients over 60 years of age, posing challenges in surgical management and postoperative care.

### Objectives

Analyse length of stay and mortality rate for patients with Distal Femoral Fractures who had Distal Femoral Replacement (DFR) or Open Reduction and Internal Fixation (ORIF)

### Study Design & Methods

A prospective comparative study was conducted involving 37 patients undergoing DFR and 151 patients receiving ORIF Distal Femur procedures. Parameters evaluated included length of hospital stay, time until surgery, and mortality rates.

### Results

Both groups demonstrated a significantly higher proportion of female patients, particularly in the DFR group, where the male to female ratio was 0.028, compared to 0.171 in the ORIF group. The mean age for DFR and ORIF patients was 83 and 82.3 years, respectively. The average hospital stay was comparable between the DFR (23.16 days) and ORIF (23.07 days) groups. Patients awaiting DFR experienced a longer wait time for surgery (6.86 days) compared to the ORIF group (2.83 days). Total mortality rates were slightly higher in the ORIF group (40.52%) compared to the DFR group (35.14%)

### Conclusions

Both DFR and ORIF procedures for distal femoral fractures in patients over 60 years exhibit similar mortality rates and lengths of stay. However, DFR is more costly and requires specialist knee surgeons, potentially delaying surgery. This study's limitations include a small dataset and lack of patient-reported outcome measures. Ongoing data collection and analysis are being conducted to further understand these treatment modalities.

## Tibial nonunion treated by IM nail – Case report

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Case report: Patient (female, 66) with open tibial fracture (G-A grade I, AO42A2) was initially treated by external fixation in a regional hospital. After 6 months there were no radiological signs of union, the external fixator was replaced with a plaster cast. After 6 more weeks, plaster was removed, and the patient was given weight bearing as tolerated. On follow ups there were still no signs of fracture healing, and increasing angular deformity was noted. Thus, intramedullary nail was applied after 15 months with xenograft (bone paste). Full weight bearing was given on 1st PO day. Bone union occurred after 6 months.



## Comminuted Distal Tibia Fractures Treated with Ilizarov Technique

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### SUMMARY

**Introduction:** High-energy distal tibia fractures are characterized by great comminution and extensive lesions of surrounding soft tissues. The risk of developing complications during treatment is high.

**Methods:** In the study were included 41 patients. Clinical characteristics were evaluated during Gustillo-Anderson, Checketts-Otterburns, and AO/OTA classification. The ASAMI protocol is used to assess bone union. Functional treatment results were represented using a modified Karlström-Ollerud scoring system.

**Results:** Using radiographic and clinical parameters, we recorded complete healing in all fractures. In intra-articular fractures group 43B, the circular fixator was removed after 16 weeks (range 13-31), while in fracture type 43C group, it was removed after 18 weeks (range 13-29). The ASAMI evaluation of bone healing showed: 31 (75%) excellent, 76 (15%) good, 3 (8%) satisfactory, and 1 (2%) poor results. Functional recovery results present after 6 months showed us a mean value of 24.7 using a modified Karlström-Ollerud scoring system in three follow-up periods, which represents recovery. Results presented 12 months after surgery showed a mean value of 27.6, representing satisfactory recovery, while during the last parameter measurement performed after 18 months, the value was 29.5, which indicates good functional recovery.

**Conclusion:** Transosseous osteosynthesis Ilizarov treatment applied in closed and open comminuted distal tibia fractures showed good final bone and function results with minimal complications.

**Keywords:** Ilizarov technique, distal tibia fractures, comminuted fractures, ASAMI classification

## Diaphyseal femur fractures treated with intramedullary nail and quality of life after osteosynthesis

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### SUMMARY

**Introduction:** The femur, the longest and strongest bone in the body, is not only protected by a large muscle mass but is also prone to fractures, especially high-energy fractures.

**Methods:** In this study, 72 patients with closed diaphyseal femoral fractures were included. The analysis period of the patients was conducted 24 months after surgery, comparing them with a non-operated control group of 20 healthy individuals. Both groups answered the SF-36 questionnaire, and by analyzing the answers we were able to assess functional abilities and quality of life.

**Results:** According to the categories of the SF-36 questionnaire, the average scores of the patients are as follows: in the category of physical functioning, the average score is 77.6, in the category of activity limitation due to physical health, the average score is 61.6, in the category of activity limitation due to emotional problems, the highest average score is 82.4, in the energy/fatigue category the lowest average score is 54, in the emotional well-being category the average score is 66.6, in the social function category the average score is good and is 81.6, in the pain category the average score is 71.6 and in the general health category the score is 64.3.

**Conclusion:** Overall, patients with intramedullary osteosynthesis of diaphyseal femur fractures have a statistically significantly lower overall quality of life than the healthy population.

**Keywords:** diaphyseal femoral fractures, intramedullary osteosynthesis, quality of life, SF-36 questionnaire

## Treatment of closed femoral shaft fractures by Selfdynamizable Internal Fixator Mitkovic

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Introduction: Femur shaft fractures are common fractures with incidence of 10/100,000 persons per year. They commonly result from high-energy trauma in the young adults, and lower energy trauma in elderly patients. Early healing, functional recovery, without complications is the goal of internal fixation. The intramedullary nail is considered the treatment of choice for nearly all femur shaft fractures. Selfdynamisable Internal Fixator Mitkovic (SIF) is an extramedullary implant for femur shaft fractures' treatment. The aim of this study was to compare these two methods regarding operation time and fracture healing without any major complications.

Material and Methods: Retrospective study analyzed two groups of patients with closed fractures of femoral treated at the Clinical Center Nis(Serbia) over a two-year period. In the first group were 20 injured patients who were treated by with SIF. In the second group were 20 patients who were treated by by the method of intramedullary locking nail. In both groups, there were 21 fractures each, as one of the injured patients in both groups had a bilateral fracture. We analyzed duration of surgery, postoperative blood replacement, healing process and postoperative complications.

Results: Fracture healing without any major complications that required additional surgical intervention in the first group of patients was achieved in 18 fractures (85.71%) while in the second group healing was achieved in 19 fractures (90.48%).

Conclusion: In comparison with intramedullary nails, SIF provides a similar results in treatment of femoral shaft fractures. SIF doesn't damage the periosteal and meduullary bone vascularization, and provides spontaneous axial dynamising.

## External fixation in distal tibia fractures : short-term outcome in 35 cases

Anis Chaabouni<sup>1</sup>, mohamed ali khelif<sup>1</sup>, seifeddine mahjoubi<sup>1</sup>, sami mbarki<sup>1</sup>, maher barsaoui<sup>1</sup>, khaled zitouna<sup>1</sup>

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**Introduction:** Distal tibia fractures result from high energy trauma and occur especially in young patients. Management of these injuries is challenging since physician is often dealing with to comminutive fractures. We aimed to study long-term clinical and radiological outcome of distal tibia fractures treated by external fixation as well as its complications. **Methods:** Thirty-five patients (23 males/12 females) with median age of 38.4 years were treated for distal tibia fractures with external fixation during the period lasting from January 2006 to January 2014. All patients were reviewed at a mean follow up of 25 months for functional and radiological assessment. **Results:** There were four C1 injuries according to Tscherne and Goetzen classification. According to the AO classification, 14.2% were type B1, 20% type B2, 20% type C2 and 25.8% type C3. Nearly all patients with associated fibular fractures (50%) underwent intramedullary pinning. Percutaneous osteosynthesis using screws was used in 76% of cases. There were two superficial pin tract infections and one deep-seated pin tract infection. Thirty four percent of patients developed algodystrophy. Osteoarthritis, instability and non union were seen respectively in 25.7%, 2.8% and 2.8% of patients. Le Chevallier score was good in 18 patients, fair in 8 and poor in 9. Kellgren and Lawrence score was good in 28%, fair in 43% and poor in 26%. **Conclusion :** Distal tibia fractures treated with external fixation are associated with high rate of complications. The use minimally invasive osteosynthesis improves functional and anatomic outcomes especially with highly comminuted fractures.

## Outcome analysis of Treatment by Bone Marrow Aspirate Concentrate in Fracture Impairments

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**Introduction:** Impairment in fracture healing leads to either delayed union or non-union. These impairments if recognised in the early period can be intervened for the prevention of these complications. These interventions have to be minimal and focused to overcome local challenges. Local infiltration of Autologous Bone Marrow Aspirate Concentrate can be one such intervention. It has the potential to trigger a conducive biological environment for fracture healing. In this study, we evaluated it for overcoming the fracture impairments as an early intervention, within 3 weeks.

**Materials and methods:** A prospective interventional study was conducted, including 10 cases of Supracondylar / Intercondylar fracture of the femur, with anticipated impairment of fracture healing. All these underwent primary stabilization followed by 3 local infiltrations of 2-3 ml of autologous PRP on 0,7, 21 days at the fracture site under C-arm IITV. **Results:** The study treated 10 cases of long bone impairment of fracture healing with the above-mentioned protocol with autologous BMAC, noting significant improvements in fracture healing with control of infection, pain and leading to the union in due time in all cases. It demonstrated the potential BMAC therapy as timely minimal interventions leading to unions in high-risk fractures, hence reducing the need for additional surgical interventions and enhancing patient outcomes. **Conclusion:** BMAC infiltration, is a potentially effective therapy for high-risk fractures going into fracture impairment, avoiding delay/non-union of fractures. This study supports the inclusion of BMAC therapy as a regenerative care strategy, for treatments in high-risk fracture management, preventing morbidities.

## Advancing Patellar Fracture Management: Case Series on an Innovative Transosseous Suture Repair Technique Utilizing Suture Anchors for Inferior Pole Fractures

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### Background:

Fractures located at the inferior pole of the patella pose challenges in terms of fracture fixation, primarily due to inadequate bone quality at the lower pole and typically limited options for secure fixation. This study introduces a novel approach that involves employing the Krackow suture technique on the patellar tendon, followed by a longitudinal trans-osseous and upside-down fixation at the superior aspect of the patella using a suture anchor to address this challenge.

### Methods:

A retrospective cohort case series was conducted at a single center, involving ten patients with fractures at the lower pole of the patella. Follow-up assessments were performed for a minimum of six months to observe postoperative gap formation and evaluate bony union. Knee motion, pain, function and any intra- and postoperative complications were documented throughout the follow-up periods.

### Results:

All patients exhibited complete bone union without gap formation six months postoperatively, accompanied by regained full range of motion without any functional deficits. No instances of postoperative anterior knee pain, re-fracture of the inferior patellar pole, or other complications were reported during the follow-up period.

### Conclusions:

The innovative technique involving the longitudinal trans-osseous and upside-down suture anchor repair for the management of inferior patellar pole fractures is a straightforward and easily executable surgical procedure. This method offers stable fixation and yields favorable functional outcomes.

## Biological reconstruction of a large bone defect after a tibial fracture

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Pilon fractures often result from high energy trauma and can be associated with severe bone comminution and soft tissue loss. Careful management of soft tissue injury holds the key to reduce complications and improve outcomes.

A 59-year-old woman presented at our emergency department following a fall from height. The patient underwent an osteosynthesis of a tibial pilon fracture with distal tibia plates, and a distal fibula plate. After one month the soft tissue loss led to the exposure of the osteosynthesis material. Consequently, the tibial plates were removed, necrotic areas were debrided, and due to a large tibial bone defect, it was decided to perform the Masquelet technique. An external fixator for distraction was applied and the bone defect was filled with a cement spacer with antibiotics. A sural flap was done to address the soft tissue loss. Intraoperative samples revealed a *Serratia liquefaciens*. The patient received multiple courses of antibiotics, and her soft tissue healing progressed favorably. Two months later, the non-viable fibular bone was excised, the cement spacer was removed, and a calcaneal-tibial arthrodesis was performed using a nail. At this point, all intraoperative samples were sterile. After nine months the patient reported being pain free and showed a complete soft tissue healing.

The two-phase method described by Masquelet has become increasingly popular as there have been promising reports of its success. Our case represents its value in the setting of a complex distal tibia fracture with severe bone and soft tissue loss.

## Traumogenesis of the Floating Hip in Patients with Polytrauma

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In recent years, there have been scientific studies devoted to the course of traumatic disease in victims with a floating hip, however, in the open access we have found almost no works devoted to the study of the influence of the causes and mechanism of this trauma on the course of the traumatic process. To perform our research, we analyzed 167 cases of polytrauma with floating hip. In the first group, a road accident was identified as the cause of the injury in 69.4% of patients. Among the dead patients, road accidents were found even more often, in 75.0% of patients. Among the patients of the first group, this cause occurred in 17.1% of cases. In the group of deceased patients with a floating hip, household trauma occurred 2.4 times less often, only 7.1% of cases. In 4.5% of patients of the first group, a criminal injury was the cause of a floating hip and polytrauma. In patients with a floating hip and polytrauma, the main cause of injury was a traffic accident, which occurred in the vast majority of patients, and work-related injuries were more common in patients who died. Among the mechanisms of injury in the surviving patients, a direct impact prevailed, and among the patients who died, a fall from a height, but in both cases as a result of high-energy trauma.



## Preoperative Hospital Stay Duration and Postoperative Delirium Risk Association: A Retrospective Analysis Following Hip Fracture Surgery

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This orthopedic study aims to explore relationship between occurrence of delirium and duration of preoperative hospital stay in patients who've undergone surgery for hip fractures. A retrospective analysis was conducted on a cohort of 102 patients who underwent proximal femoral nailing for intertrochanteric fractures of femur between May 2016 and December 2023. Patient records were examined to gather data on preoperative hospital stay, existing conditions and surgical variables. The Confusion Assessment Method (CAM) was employed to identify instances of postoperative delirium. Patients displaying symptoms predisposing to delirium during postoperative period're referred to psychiatry department. 36 patients developed delirium postoperatively with average preoperative hospitalization duration calculated at 6.18 days (4-28 days). The study identified statistically significant correlation between extended preoperative hospital stays and increased incidence of postoperative delirium ( $p < 0.05$ ). Patients whose preoperative hospital stay exceeded four days're found to have 35.2% higher risk of developing delirium compared to shorter stays. Additionally, certain preexisting conditions like dementia and Alzheimer's disease're identified as risk factors for delirium. Management of hip fractures also requires extensive clinical monitoring throughout preoperative and postoperative phases. Proper orthogeriatric care can reduce duration of hospital stays, number of complications, mortality rates. Key considerations during surgery include pain management, early mobilization, fluid management, delirium prevention. This research highlights importance of considering duration of preoperative hospital stay as a potential predictor for development of delirium following hip fractures. Early identification of at risk patients, targeted preoperative interventions can decrease incidence of delirium in this population and enhance overall postoperative outcomes. Further prospective studies are necessary to validate these findings and investigate preventive strategies.

## Functional Outcome of Neglected Tibia Plateau Fracture Fixation: Our Experience from Tertiary Care Hospital in Low Socioeconomic Country

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Neglected Tibia Plateau fractures are one of the most challenging because of complex anatomy and soft tissue insult which causes the greatest impact on its outcome. The study aims to see the functional outcomes of neglected tibia plateau fractures that underwent surgery. **Methods:** This study is a retrospective chart review of 70 patients from June 2020 to June 2023. Patients with neglected tibia plateau fractures, presenting three weeks post-injury, underwent open reduction, and internal fixation were included. Functional outcomes were evaluated using the Oxford Knee Score and range of motion. We were assessed for postoperative complications six months after surgery. **Results:** Of the 70 patients, 3 were lost to follow-up. The mean age was 39.1 +/- 13.2 SD, with 60 (85.7%) males and 10 (14.3%) females. Road traffic accidents accounted for 88.6% of injuries. Functional outcomes revealed 53 (75.7%) patients with excellent scores, 12 (17.1%) with good scores, and 2 (2.9%) in the fair category according to the Oxford Knee Score. Range of motion analysis showed 50 (71.4%) patients with 130-degree flexion, 16 (22.9%) with 120-degree flexion, and 1 patient with 90-degree knee flexion. Postoperative complications included wound infection in 4 (5.7%) patients, while knee stiffness was observed in 4 patients, managed with physiotherapy, and 1 patient had quadricepsplasty.

**Conclusion:** Neglected tibia plateau fractures present a challenging surgical scenario influenced by anatomical and skin-related issues. However, with meticulous attention and anatomical reduction, positive outcomes can be achieved even in delayed cases.

## Comparative Analysis of Lower-Limb Open Fractures: Impact of Arterial Injury on Clinical Outcomes - A Retrospective Cohort Study

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This study aims to delineate the ramifications of fractures with vascular involvement in contrast to fractures without vascular injuries, elucidating the unique challenges encountered in orthopedic care.

**Methods:** A retrospective cohort study was conducted from January to December 2022, the study involved 46 adult patients with open lower extremity fractures. Two distinct groups were analyzed: the control group without vascular injury and the second group with a focus on vascular (popliteal artery) injuries. **Results:** The mean age of patients in both groups was 36.7 +/- 17.6 SD. Vascular injuries occurred in 23 patients (50%), while the non-vascular group consisted of 23 patients (50%). The operating time for the vascular group was within 6 hours, while the non-vascular group had an operating time of 24 hours. In the vascular group, 2 (8.7%) patients required limb amputations, and 10 (43.5%) developed wound infections. All patients were managed with an external fixator, with only 4 (17.4%) requiring definite fixation. Non-union occurred in only one (4.3%) case, and four patients (17.4%) underwent flap procedures. In the group without vascular injury, 13 (56.5%) developed limb infections, and 7 (30.4%) required flap procedures. No amputations were performed in the non-vascular group, and 6 (26.1%) patients required definite fixation. Although the vascular injury group exhibited significantly improved outcomes, the p-value was insignificant. **Conclusion:** This study's findings emphasize the necessity for a tailored approach to fractures with vascular involvement, highlighting the importance of early and comprehensive management in improving patient prognosis

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## Osteosynthesis for the treatment of distal tibia fractures: functional and quality of life assessment

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**Introduction:** Tibial pilon fractures are metaphyseal-epiphyseal joint fractures with a high potential for sagittal instability. Osteosynthesis is often preferred, with success contingent upon good anatomical reconstruction of the articular surface. We aimed in this study to evaluate the quality of life after surgical treatment of such fractures. **Methods:** A retrospective study was conducted on 10 patients with average age of 58 suffering of distal tibia fractures treated by open reduction internal fixation (ORIF) during the period lasting from January 2016 to November 2023. All patients were summoned for functionnal and quality of life assessment. **Results:** One fracture was nonarticular, five were type III and four type II according to Ruedi and Allgower classification. Osteosynthesis was exclusively performed using a plate. According to The Olerud Molander Ankle Score (OMAS) functionnal outcome were satisfactory in five cases, fair in four cases, and poor in one. The mean results of different headings of the SF36 score were physical functioning 55%, energy / fatigue 41%, emotionnal well-being 43%, social functioning 48,5%, pain 62%, general health 53,7%. **Conclusion:** Surgical treatment outcomes for tibial pilon fractures by ORIF reveals a concerning trend towards poor functional results. Achieving satisfactory outcomes remains challenging due to factors like fracture severity and soft tissue condition.

## Ilizarov In Complex Open Both Bone Leg Fractures

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Open Grade 3b Both Bone Leg Fractures are challenging injuries for even the most experienced orthopaedic surgeons.

In order to manage these injuries we often need multiple surgeries with the help of plastic surgeons and infectious disease specialists to salvage these limbs which can often end up with amputation if they are not thoughtfully managed.

Ilizarov along with a basic understanding of skin grafts and rotation flaps can arm an orthopaedic surgeon to effectively deal with these complex injuries. Methods: We have a case series of 11 patients from Jan 2017- October 2023 who had these complex injuries and were advised amputations from major tertiary hospitals which were finally salvaged. Results: All limbs were salvaged after multiple procedures. Conclusion: Ilizarov acts as an essential tool in the armamentarium of limb reconstructive surgeons who can save these limbs of these patients without complex plastic surgery skills like free flap specially in resource deficient centres where microsurgical expertise may not be available.

## A Methodology of a Concurrent Bilateral Tibia interlocking nailing: The rhythm of the dance

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We report a case of a young gentleman who sustained bilateral close tibia fracture after involve in motor vehicle accident. Later, patient was treated with bilateral interlocking tibia that performed simultaneously in same setting concurrently with a surgeon on each side. In this setting, we able to complete both procedure without any significant complication in a single procedure average timing. This presentation incorporates the methodology and preparation intraoperatively for the patient, limb positioning and most importantly the 'image intensifier' positioning and movements intraoperatively. We includes the pearls, tips and tricks in smoothly executing the surgery.

## Role of teriparatide in management of osteoporotic inter trochanteric femur fracture A prospective randomized controlled trial

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**BACKGROUND:** Despite the surgical advances, obtaining the desired outcome in osteoporotic intertrochanteric femur fractures is still a tough challenge for the surgeons. Consequently, the interest of the researchers has shifted towards establishing a holistic approach for managing such injuries. Teriparatide, a recombinant form of human parathyroid hormone, is a novel drug that has been proved to hasten fracture healing in both animals, and humans. We attempted to evaluate the effect of Teriparatide therapy in surgically fixed osteoporotic intertrochanteric femur fractures and provide the groundwork for further research in this area. **METHODS:** The results of osteoporotic patients who underwent only Proximal Femur Nailing [PFN] for intertrochanteric femur fractures were prospectively compared to the patients who received an additional Teriparatide therapy. We aimed to identify the effect of Teriparatide on the time to fracture union, bone mineral density [BMD], and other fracture related post-operative complications. The functional outcome was assessed using the Lower extremity functional scale. **RESULTS:** All patients were followed up for 6 months by which time all the fractures united. However, in the Teriparatide group, time to fracture union was shortened by about 2 weeks and improvement in BMD and functional outcome were significantly better. The rate of migration of the helical, varus collapse, and femoral shortening did not show any relevant difference. **CONCLUSION:** Early union coupled with better functional improvement and a substantial increase in BMD tips the balance in favour of the Teriparatide therapy in osteoporotic patients with intertrochanteric femur fractures.

**KEYWORDS:** Intertrochanteric, fracture union, osteoporotic fractures, teriparatide

## Retrospective Analysis of Significance of Tip Apex Distance in Intertrochanteric Fracture Femur treated using Proximal Femoral Nailing

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Introduction: Screw head cut out accounts for a majority (84%) of all the failed intertrochanteric fractures managed by surgical fixation. This has been attributed to osteoporotic changes in the head and neck of such fracture patients. Thus, an area of maximum bone stock should be selected for the threads of the screws to engage. This reduces the chances of screw cut out. In DHS, a widely acceptable criteria for intraoperative indicator of deep and central placement of the lag screw was ascertained. For the standard PFN (Proximal Femoral nail) there are no fixed criteria for the screw placement. This study helped to evaluate the association between the tip apex distance with the functional and radiological outcomes for the management of Intertrochanteric fractures of femur by proximal femoral nail. Method : Consecutive 100 patients of intertrochanteric fracture femur surgically treated with proximal femoral nail were studied ranging from 18 to 65 years of age. Results : The result and the criteria obtained from this study helped ascertain the standard criteria for screw placement in proximal femoral nail. Despite no given criteria this study helped to make some ground rules for the same. Conclusion: The tip apex distance is essential in better outcomes of surgically treated intertrochanteric fractures using Proximal femoral nail (PFN).



## Prognostic Factors Influencing the Occurrence of Drug-Induced Renal Dysfunction During Continuous Local Perfusion Therapy

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Continuous local antibiotic perfusion (CLAP), in which gentamicin is injected directly into the infection site, has been developed to manage bone and soft tissue infections. However, gentamicin is nephrotoxic, and CLAP is often associated with complications, including acute kidney injury. This study investigated the frequency of complications and factors influencing their occurrence in patients who have undergone CLAP. 82 patients who underwent CLAP at our hospital between January 2020 and September 2023 were included. The primary outcome was the occurrence of renal dysfunction within 1 month after CLAP. Additionally, the following factors were evaluated: history of diabetes and liver dysfunction, site of injury, initial open wound, skin defect, hemodynamic compromise, concomitant antibiotics use, type of treated tissue, purpose of treatment, drainage method, duration of CLAP, and total gentamicin dose. Logistic regression analysis was performed to identify prognostic factors. Of the 82 patients, 49 were cured, 13 underwent successful infection prevention, 14 experienced infection recurrence, 3 underwent amputation of the affected limb, and 1 died. The side effects of the treatment included decreased renal function in 13 cases and drug eruption in 1 case. Logistic regression analysis showed that age (odds ratio [OR]: 1.07; 95% confidence interval [CI]: 1.0–1.13) and CLAP duration (OR: 1.06; 95% CI: 1.01–1.12) were significant prognostic factors for the occurrence of renal dysfunction.

Shortening the duration of CLAP in older patients should be considered. Considering the pharmacokinetics, a variable concentration regimen of gentamicin may be more effective and less nephrotoxic than the continuous administration of a fixed concentration.

## Masquelet Technique a forgotten art, execution in precision, a favourable option in bone loss reconstruction: A case report

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Posttraumatic segmental bone defects remains a challenge as these complex lesions are difficult to treat and lead to significant morbidity. Here we report a polytrauma long bone fracture which was complicated with infection and osteomyelitis needing resection of the affected femur bone. The Masquelet technique was used to treatment the large segmental bone defects and consisted of a two-step procedure. In the first one after the debridement, a bone cement spacer was introduced in the bone defect followed by the reconstruction of the soft tissue. The antibiotic cement spacer inserted induces a foreign body reaction with the formation of a well vascularized membrane. In the second step, performed after six to eight weeks, the spacer was removed, and the defect filled with bone graft. In this study, the patient sustained an open fracture of right femur but unfortunately it was complicated with infection which led to osteomyelitis of right femur. Defect bone resected till healthy margin around 8cm. Definitively, interlocking nail inserted over right femur, then bone graft taken from ipsilateral iliac with Demineralized Bone Matrix. Several studies compare usage of taking plate fixation into consideration in Masquelet Technique. Intramedullary nail seems to have faster union, lesser grafting procedure and less reoperations for all causes than those treated with plates. Comparative studies were made between Masquelet technique versus Ilizarov bone transport or lengthening for reconstruction. Bone union was similar, but Masquelet technique showed better outcomes than Ilizarov. Utilisation in precision will benefit patients as a functional option for reconstruction.

## Crocodile bite, a toil and snare of its own complexity – a single deep bite with multiple rippling impacts : A case report

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Crocodiles are ferocious creatures of the tropics. In Malaysia, a total of 205 crocodile attacks were reported in 20 years. Most of these attacks occur in Sarawak (between 135 to 164 cases) and Sabah (70 cases). Though different species are found, all has been reported to have one common factor, a human attack leads to significant morbidity and mortality.

A crocodile's bite causes fatal and non-fatal injuries. Once they close their jaw, it will be kept closed as its mouth-opening muscles are weaker. Another mechanism of the crocodile bite is the death roll – a rotating manoeuvre with the aim of dismembering their prey. The sheer force of this mechanism allows them to subdue victims larger than their own size. This case reports a victim of a crocodile attack leaving significant debilitation for its bite. This paper also explores into understanding the of these creatures in its existence. If a crocodile is not killing its prey, it is causing detrimental injuries especially to the extremities, giving the Orthopaedic Department a challenge to handle. Injuries from a crocodile bite has been recorded to range from extensive tissue damage, vascular injuries, fractures and even amputations. Once the injuries are dealt with, another obstacle to overcome is the severe bacterial infection that comes after the bite. Many bacterial species are found in the oral cavity of a crocodile, and most are polymicrobial with resistance to the common antibiotics used. We report our approach and management of this complex crocodile bite.

## Effect and validity of BOAST Guidelines for Safe Tourniquet Use: A National Audit across 9 UK NHS Trusts

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**Introduction:** The safe application of tourniquets in surgical procedures is essential for minimizing blood loss and preventing tourniquet-related complications. The British Orthopaedic Association (BOA) developed guidelines (BOAST) to standardize practices and enhance patient safety. **Objectives:** The primary objective was to assess the impact of the guidelines on surgeons' awareness of safe tourniquet use in NHS. **Methods:** We conducted a closed-loop national audit across 9 UK National Health Service (NHS) trusts through Two questionnaires including 105 surgeons, one in January and the second in March 2022 after distributing the guidelines. We assessed surgeons' knowledge of safe time and maximum pressure in upper and lower surgeries in different age groups and the management of associated complications. **Results:** Analysis of data revealed varying degrees of awareness and adherence to the BOAST guidelines across the participating NHS trusts. After the guidelines, the awareness of safe tourniquet pressure for adult upper limb surgeries improved from 7.8% to 33.3%, awareness of safe pressure for adult lower limb surgeries improved from 6.8% to 44.4%, awareness of safe pressure in pediatric limb surgeries improved from 46% to 71%, awareness of safe tourniquet time improved from 64.3% to 71.4%, and understanding of principles of management of associated complications of tourniquet improved from 24.3% to 85.7%. **Conclusion:** This national audit underscores the importance of BOAST guidelines in promoting safe tourniquet use across diverse settings within the NHS. BOAST guidelines are valid, and effective and have a significant impact on improving surgeon awareness about the safe surgical use of tourniquets.

## Title: How Geriatric Care Prevents Geriatric Fractures

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As individuals age, they become more susceptible to various health issues, including geriatric fractures. These fractures can have severe consequences for older adults, leading to pain, reduced mobility, and a decline in overall quality of life. However, with proper geriatric care, these fractures can be prevented or minimized.

#### 1. Regular Physical Activity:

This may include activities such as walking, strength training, and balance exercises, which help improve muscle strength, coordination, and balance, reducing the risk of falls and fractures.

#### 2. Medication Management:

Careful management of medications, as certain medications can increase the risk of falls and fractures in older adults. This proactive approach helps reduce the risk of fractures caused by medication-related side effects.

#### 3. Nutritional Support:

Proper nutrition plays a vital role in maintaining bone health and preventing fractures to develop personalized nutrition plans that include adequate calcium, vitamin D, and other essential nutrients.

#### 4. Fall Prevention Strategies:

By improving lighting, and installing handrails and grab bars. Additionally, healthcare professionals may recommend assistive devices like canes or walkers to enhance stability and reduce the risk of falls.

#### 5. Regular Health Assessments:

Regular health assessments such as bone density scans, vision and hearing tests, and evaluations of gait and balance.

#### Conclusion:

Geriatric care plays a vital role in preventing geriatric fractures by regular physical activity, medication management, nutritional support, fall prevention strategies, and regular health assessments. By implementing these preventive measures, older adults can maintain their independence, reduce the risk of fractures, and enjoy a higher quality of life.

## Tension Band Wiring as a Salvage Procedure for Failed Locking Patella Plate in Patella Fracture: A Case Report of a Professional Footballer

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**Introduction:** Patella fractures in athletes are often considered season ending injuries. However return to professional sports has been documented widely in literature. Tension band wiring has been the mainstay of treatment in patella fractures but due to implant irritation, locking patella plates are gaining popularity in athletes. Plates possess advantages of biomechanical stability and decreased incidence of implant failure. **Case Presentation:** We present a case of a 22-year-old professional footballer who sustained a comminuted patella fracture (34C3) after sustaining a fall while playing football. He underwent open reduction and internal fixation with a locking patella plate. However, at six weeks post-surgery, the patient presented with implant failure, with the plate backing out from the upper pole of the patella. Tension band wiring was undertaken while keeping the patella plate in situ in the revision surgery. **Management and Outcome:** The postoperative period was uneventful, and the patient was able to achieve good functional outcomes with complete union of the fracture. At 6 months follow-up, the patient had returned to sports and rejoined professional football at 10 months post surgery without any limitations. **Conclusion:** Locking patella plates are a viable option for the treatment of patella fractures, but implant failure can still occur due to mismatch of size and contour of these plates. In such cases, augmentation with a tension band wiring can provide stable fixation and promote fracture healing.

## “Surgical treatment of unstable trochanteric fracture of femur in elderly patients with SARS-CoV-2 infection”

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**Introduction:** Surgical treatment of elderly patients with unstable trochanteric fracture of femur is difficult, uncertain and with unpredictable outcome due to prolonged pre-operative care, delayed surgical intervention and complex rehabilitation. **Method:** Retrospective analysis included 16 elderly patients with unstable trochanteric fracture of femur, bilateral pneumonia and SARS-CoV-2. **Surgical method:** closed reposition of fracture under control of x-ray and internal fixation with Trigen Intertan Intertrochanteric Nail. **Anesthesia:** regional (spinal) or endotracheal anesthesia. **Results:** Patients' age was between 65 and 92 years. The shortest pre-operative period was five days in the patient with TSS (Total Severity Score) 5 on CT scan of lungs. The longest pre-operative period was 25 days in the patient with TSS 12 of CT scan of lungs. ASA score III was in 15 patients and ASA score II in one patient. **Anesthesia:** 11 (73%) patients received regional-spinal anesthesia, while 5 patients received endotracheal anesthesia. There were two post-operative negative/death outcomes. **Conclusion:** Surgical treatment of elderly patients with unstable trochanteric fracture of femur and SARS-CoV-2 infection is necessary to undertake as soon as health conditions are met and patients are capable for introducing in spinal or endotracheal anesthesia. **Key words:** surgical treatment, unstable trochanteric fracture of femur, elderly patients, bilateral pneumonia, SARS-CoV-2 infections.

## Management of the Gangrenous Conditions in Orthopaedics by Platelet Rich Plasma

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Introduction; After high-velocity trauma, devascularization leads to the death of vital structures including Bone, Tendons, Muscles and Skin flaps. Open fractures associated with prolonged exposure of the underlying tissue and the presence of infection are critical factors, leading to further damage, such as the sequestration of bones. A vicious cycle of necrosis, infection and more tissue losses sets in. The reversal of vascular viability in these tissues is ordinarily not possible with management in vogue. A ray of hope is evolving through propagating "Proliferative healing" through regenerative products such as Platelet Rich Plasma (PRP). The basis of proliferative healing is induced neo-angiogenesis. Material & Method: This study investigates PRP as a stimulant & trigger for proliferative healing leading to the salvage in such critical near-dead tissues. It is a case series of 25 complex wounds of limbs having severe necrosis after Compartment syndrome, Diabetic gangrenes, Open fractures and crush injuries. Results: A protocol for the reversal of Gangrenous changes in the complex wounds of vital structure has been evolved. The safety, standardisation towards the form, method, doses and duration efficacy of PRP-led treatment are presented. Conclusion: "Re-inducing Viability through induction of Neo-Angiogenesis in such near-dead tissues is possible, through autologous Platelet Rich Plasma, which induces neo-angiogenesis, conducive to Milieu for their survival and regeneration.



## Delay in Scheduled Orthopedic Surgeries: prevalence and associations

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### Background:

Worldwide, millions of major surgical procedures are operated on annually. Operative timing and prolonged scheduled operations are a global dilemma. Accurate estimating of the surgery time is a crucial skill for surgeons and an integral factor in scheduling operating rooms (OR). Both over and under-estimation of procedure time would affect the quality of using operating rooms. This article aims to study the prevalence and associations of prolonged orthopedics surgery duration.

### Method:

This retrospective single-center cohort study was conducted among orthopedic surgeons in a tertiary hospital in Eastern Province, Saudi Arabia. Data was collected from the documented data before and after each procedure from the medical reports. Patient demographics, medical status, diagnosis, Anesthesia start and end time, estimated surgery time, actual surgery time, and length of stay were all included and analyzed.

### Results:

209 operations were reviewed and included. Patients' mean age was 34.8 (SD 21.1) years old, with more than half (51.2%) being males. The most common method of surgery was elective (89.5%). Nearly half (48.8%) were medically free. Delayed surgical duration was seen in 46.4% of the cases. The mean duration of anesthesia was 3.60 hours, while the mean duration of the operating time was 4.37 hours.

### Conclusion:

In conclusion, prolonged scheduled operations are a universal problem requiring more attention. Patient comorbidities were the most observed factors affecting operation duration, emphasizing the importance of taking patient factors into consideration, individualized scheduling, and estimating the time of an operation for each case.

## Indications and Complications of hardware removal in Orthopaedic trauma: A tertiary care hospital based retrospective study

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**Introduction:** Indications for hardware removal are not well defined in the literature, and there is a lack of consensus among Orthopaedic surgeons, regarding implant removal and its complications. Hence this study is done to evaluate the commoner indications for implant removal and its complications.

**Aims:** Assessment of outcomes following implant removal in Orthopaedic trauma.

**Objectives:** To evaluate indications of hardware removal, to determine Complications of hardware removal within six months post implant removal.

**Material & Methods:** Study Design: Retrospective Observational Study. Patients included from January 2011 to December 2020.

**Results:** Patient's personal preference (49.4%) was the commonest indication in our study. However, persistent pain (14.8%), infection (8.6%), hardware prominence (8.2%), stiffness (4.5%), non-union (4.0%), and broken implants (3.2%) were the other indications recorded for implant removal in our retrospective study.

Incomplete removal of implant (10%), impaired wound healing (2%), re-fracture (1.7%), and infection (0.9%) were the most common complication following Orthopaedic surgery among the study subjects enrolled in our study.

Based on the findings of our study it could be concluded that the most common indication of implant removal was patient personal preference followed by persistent pain and infection in our series.

Incomplete implant removal was the most common complication. Hence, to accomplish safe removal of implants we need thorough pre-operative planning, precise surgical skills, and the availability of suitable instruments. Proper counselling prior to surgery to be done and explain about pros and cons of implant removal. It is also recommended to formulate an institutional policy for impalnt removal.

## A case Report: Ilizarov Frame Osteosynthesis for Nonunion Clavicle Fracture with Chronic Osteomyelitis

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**Introduction:** In cases of nonunion of clavicle fractures with chronic osteomyelitis, the method of fixing bone fragments remains a challenge due to limitations in the use of immersion osteosynthesis.

**Case report:** A 34-year-old male patient was injured in a traffic accident and fell from a scooter. The clavicle was treated with osteosynthesis using a locking plate. After one month, the patient began to experience pain, redness, high temperature, and a fistula in the surgical area. In our clinic was performed the first stage of operative treatment of plate removal and sequestrectomy and in the second stage was conducted osteosynthesis using the Ilizarov frame. The fracture healed four months after surgery and the Ilizarov frame was removed, and full restoration of shoulder joint movement was achieved. There was no recurrence of osteomyelitis or clavicle refracture during the nine-month follow-up period.

**Discussion:** Despite the advantage of using the Ilizarov frame against osteomyelitis, this method has disadvantages. First, this method may be difficult to perform for a surgeon with little or no experience with the Ilizarov frame. Second, there are few studies comparing the treatment of clavicle fractures with osteomyelitis using the Ilizarov method with other methods.

**Conclusions:** The Ilizarov frame may become the preferred method for osteosynthesis of clavicle fractures with osteomyelitis due to its advantages in extraocular osteosynthesis.

## MRI in acute torticollis syndrome in children

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**Background:** The causes of torticollis in children can be divided into primary (congenital) and secondary (acquired). Of particular interest in pediatric practice is acute torticollis syndrome - a condition characterized by acute onset of neck pain, restriction of movements and forced tilted and turned position of the head. **Purpose:** To study the possibilities of MRI in acute torticollis in children. **Material and methods:** The study included 28 children aged from 2 to 17 years with acute torticollis of different etiology. MRI of the craniovertebral junction and cervical spine was performed on Philips Achieva dStream 3.0T and Ingenia Ambition S 1.5T tomographs within one to six days from the onset of symptoms. **Results:** Odontoid lateral mass interval asymmetry was detected in 12 of 28 children. However, rotation in the C1-C2 segment was noted in only two patients. Inhomogeneity of the alar ligaments was noted in 11 patients (in 4 patients in combination with odontoid lateral mass interval asymmetry). The effusion in the C1-C2 joints was noted in 22 children. Hyperintense signal areas in the uncovertebral regions of the upper cervical segments (the so-called "uncovertebral wedge" phenomenon) in combination with antalgic scoliotic deformity of the cervical spine were detected in 12 patients. **Conclusions:** Acute torticollis in children and adolescents is a nonspecific syndrome that requires a thorough search for its causes. True rotatory subluxation in the C1-C2 segment is rare. The phenomenon of "uncovertebral wedge" requires further study. MRI allows obtaining more accurate information about the etiology of acute torticollis.

## Project Torus – Assessment of the parental satisfaction regarding the absence of a systematic follow-up at 4 weeks

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**Introduction** – Distal radius torus fractures are frequent in the pediatric population. It has been shown that torus fractures can be treated efficiently by softcast, which can be removed at home, thus, eliminating the need to have a 4-week follow-up. **Objectives** – The primary objective is to assess the parental satisfaction regarding the absence of a systematic 4-week follow-up for distal radius torus fractures treated by softcast. The secondary objectives are the complication rate and absenteeism from school and work. **Method** – A case series was conducted at the CIUSSS Estrie-CHUS amongst children from age 3 to 12 divided in two groups: 1) 4-week follow-up and x-ray (control) and 2) no 4-week follow-up and informative pamphlet (intervention). Two satisfaction questionnaires, SAPS and CSQ-8, were completed at the initial visit and at 4 weeks. A home-made questionnaire was completed to compile the hours of work and school missed. **Results** – Between 2018-2021, 154 patients were included (77 controls and interventions). Seventy-three percent of parents in the intervention group were very satisfied with the care received according to the CSQ-8 questionnaire (vs 56% SAPS and 76% CSQ-8 for the control group). In average, the intervention group spared 5 hours of work and school. There was no complication reported during the study in both groups. **Conclusion** – The absence of a systematic 4-week follow-up for distal radius torus fracture is acceptable for parents. It avoids absenteeism from work and school, reduces the amount of x-ray exposition and the complication rate is null.

## Comparison of Lateral Divergent and Cross Pinning Orientation for the Treatment of the Supracondylar Fractures: A Prospective Comparative Observational Study

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**Introduction:** Supracondylar fractures is one of the most frequent fractures in children aged five to ten with extension type being most common anatomical pattern. For the patients who are recommended for surgery, percutaneous pinning remains the mainstay of the treatment. This study compared the functional and radiological outcome of cross pinning with lateral divergent pinning.

**Method:** In this prospective comparative study, children who underwent percutaneous pinning with lateral divergent and cross pinning orientation were included. Along with preoperative demographic data, loss of Range of movement as compared to contralateral side, carrying angle loss,

Humerotrochlear angle loss and radiological acceptability at 24 week post operative day were

observed and analyzed with SPSS. **Results:** A total of 50 patients (25 lateral pinning and 25 cross

pinning) were included in the study. There was no significant difference ( $P > 0.05$ , CI 95%) of loss of

range of movement ( $2.68 \pm 2.41$  to  $2.8 \pm 1.73$ ), loss of carrying angle ( $1.92 \pm 2.13$  to  $2.04 \pm$

$2.96$ ) and loss of humerotrochlear angle ( $3.32 \pm 2.74$  to  $3.28 \pm 2.50$ ) in between cross pinning and

lateral pinning respectively. **Conclusion:** In summary, there is no significant difference in outcome in

terms of loss of carrying angle, range of motion and Humerotrochlear angle between cross pinning

and lateral divergent pinning methods and a surgeon can choose any orientation for a better

outcome according to his ease.

## Pelvis fractures in children

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Pelvic fractures are infrequent in children but represent one of the most serious fractures in pediatric age group. Often, they are associated with polytrauma and severe bleeding. Usually are classified in four types, according to Torode and Zieg. Treatment can be conservative or surgical. The aim of our research was to analyze frequency of different types of pelvic fractures in children and their treatment. Retrospective study of medical records, X-ray sets, CT scans and operative charts of pediatric patients treated for pelvic fractures in a 15-year period (January 2007 – December 2022) was conducted. Patients treated in outpatient clinic and patient older than 18 years were excluded from the study. In the study period 49 patients with pelvic fractures were identified. Six patients (12%) had Type I fractures, four (8%) Type II, twenty-three (47%) Type III, eleven (22%) Type IV, and five (10%) had acetabular fractures. Patients with stable fractures (36; 73%) were treated non operatively while 13 patients (27%) were treated surgically. Three patients with minimally displaced acetabular fractures were treated with hip spica cast. Eleven patients (22%) with unstable type IV fractures and two patients with displaced acetabular fractures were treated surgically. Skeletal traction was applied in four patients, external fixation in six and open reduction and internal fixation in three patients. Majority of pediatric pelvic fractures are stable with predominance of Type III, and they may be treated non operatively. Unstable pelvic ring disruptions (Type IV) and acetabular fractures require surgical treatment.

## The use of nitinol for the production of osteosynthetic material used in children

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Commonly used osteosynthetic material is made of materials with much higher Young's modulus and therefore they are stiffer than human bone. These materials limit the micro-movements necessary for secondary bone healing. The Young's modulus of nitinol is much closer to that of human bone, thus providing smaller stress shielding between the implants and the adjacent bone. In addition to its lower stiffness and biocompatibility, nitinol has other important properties - shape memory and superelasticity. So far the use of nitinol has been limited by conventional manufacturing techniques such as casting or powder metallurgy. The development of 3D-printing eliminates these problems and allows the construction of homogeneous complex nitinol structure. This is the reason why the production of NiTi components increased in recent years. Of the various 3D printing methods, the most promising appears to be the direct deposition DED (directed energy deposition, also commercially known as LENS (laser-engineered net shaping), from a mixture of NiTi powder. This method creates objects layer by layer using high-power laser (3-4 kW) from the powder material. The resulting product properties are influenced by manufacturing process. The disadvantage of this method is the need for subsequent heat treatment due to high stress, poorer surface quality and an expensive and slow process. In addition, Nitinol enables the use of the so-called 4D-print in the production of osteosynthetic material. In this process, the 3-D printed product changes its structure due to external forces - heat, light or mechanical energy.



## How the COVID-19 pandemic has altered the pattern of pediatric trauma?

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Background: The COVID-19 pandemic caused significant alterations to children's daily activities. We aimed to make a comparison between the fracture features in 2018 and 2019 and 2021 with those in the lockdown era (the time when the pandemic first emerged). Methods: We performed a single-center retrospective review of patients from a third-level hospital from March 16 to May 26 for the years 2018, 2019, 2020, and 2021. The assessment was conducted based on the patients' age, type of injury, and placement of the fractures. Results: A total of 570 patients with 773 fractures were examined. The average daily fracture decreased from 2.86 to 1.61. Before the pandemic, the average age was  $8.6 \pm 4.04$ ; during it, it plummeted to  $7 \pm 4.58$ ; and after it, it rose to  $9 \pm 4.45$ . The pandemic reduced applications for children aged 6 to 11 by 19.5% ( $p = 0.001$ ) but increased applications for children aged 0 to 5 by 27.4% ( $p = 0.000$ ). After the pandemic, these numbers stabilized. Traffic accident-related surgeries on children decreased significantly during the epidemic ( $p = 0.003$ ). Falls from height increased significantly ( $p=0.000$ ). Statistically, sports injuries decreased ( $p = 0.012$ ). Presentation time didn't increase. Pandemic hospital stays were much shorter than prepandemic and postpandemic stays ( $p = 0.002$  and  $0.098$ ). Conclusions: Pandemics have reduced the number of patients and their age at presentation. Variations in the types of trauma were noted. The increase in falls from height is disturbing. In such cases, anticipating trauma trends can aid planning.

## Modified external fixator in pediatric multilevel noncontiguous cervical spinal fracture dislocation: A case report

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**Introduction:** Spinal column trauma is relatively uncommon in the pediatric population, representing 1-2% of all pediatric fractures, and most of these injuries involve the cervical spine. Multilevel injuries are classified as “noncontiguous” if there is preservation of at least one uninjured articulation between the injuries. Noncontiguous traumatic injuries of the cervical spine in children are rare. Over the past decade, surgical fixation of cervical spine injuries has gained popularity due to better imaging and improved surgical techniques. Despite these advances, surgery is not indicated for all patients. Conservative treatment, with the use of external fixator, still has an important role to play.

**Case Presentation:** We report below the case of A 10-year-old boy who presented a posterior displaced fracture dislocation of the odontoid type II Anderson and Alonzo complete (tetraplegia with loss of feeling and movement of both upper and lower extremities treated with a modified external fixator. It was made by the halo ring, the Ilizarov system and the halo vest (artificial synthetic jacket). The external fixator was removed after 3 months of immobilization. At time of discharge, control MRI showed decompression of neural elements and restoration of bone alignment. At final follow-up (3 years after injury), he has fully recovered his neurologic functions and the control CT scan showed bone healing.

**Conclusion:** The clinical course in this case report was interesting in that the patient initially suffering ASIA A complete tetraplegia fully recovered to ASIA E, and conservative treatment with halo traction followed by halo-cast device.

## Surgical Outcomes of Acetabular Fractures in Elderly Patients

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**Introduction;** The aging population has led to an increase in the incidence of fragility fractures. While treating these fractures has garnered attention, the optimal approach to acetabular fractures remains a problem. This study presents the outcomes of acetabular fracture treatment in patients aged 75 and above at our institution.

**Methods;** From April 2012 to December 2022, 145 acetabular fractures were operated. Of these, 87 patients who could be followed up for at least one-year post-surgery were included, excluding cases with chronic conditions. Factors such as age, gender, BMI, injury mechanism, ISS, fracture type, waiting days, operative time, intraoperative blood loss, perioperative transfusion, postoperative reduction (X-ray, CT), and Matta Score at six months and one-year post-surgery were investigated. Differences between groups were tested using the Wilcoxon test, with  $P < 0.05$  considered significant.

**Results;** Patients were divided into an elderly group (Group E, 7 cases) and a control group (Group Y, 80 cases). There were no differences in BMI, ISS, injury mechanism, operative waiting time, operative time, blood loss, or transfusion volume. Postoperative radiographic evaluation by Matta criteria was perfect in 5 patients in Group E and 66 patients in Group Y. The mean postoperative CT gap and step-offs show no difference. Matta's clinical outcomes were 15.2 at 6 months and 16.7 at 1 year in Group E, and 15.8 and 16.9 in Group Y. **Conclusions;** Surgical outcomes for acetabular fractures in elderly patients were satisfactory. However, compared to Primary THA, the requirement for postoperative non-weight bearing was a disadvantage, warranting further investigation.

## Short-Term Outcomes of Sacral and Pelvic Ring Fractures in Multiple Trauma Patients

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**Introduction:** Sacral and pelvic ring fractures require early internal fixation to improve systemic conditions and obtain functional recovery. Particularly in cases of polytrauma, timely surgery, performed as soon as the systemic condition permits, allows for both life-saving and functional restoration. This study aims to clarify the outcomes of early surgical intervention for sacral and pelvic ring fractures in polytrauma patients admitted to our trauma center. **Methods:** Among 77 patients admitted for sacral and pelvic ring fractures from April 2019 to September 2023, 21 patients who underwent surgical intervention were included in this study. The average age was 43 years, with 11 male and 10 female patients, and 16 cases had an Injury Severity Score (ISS) > 16. Patient outcomes, days to internal fixation, length of hospital stay, postoperative complications, and functional recovery were evaluated. **Results:** There were no deaths, and all patients were discharged to rehabilitation facilities with an outpatient follow-up rate of 86%. The mean time to final internal fixation was 42 hours, with an average hospital stay of 17 days. Complications included 2 cases of superficial infection, 1 case of pneumonia, 1 case of tracheostomy, 4 cases of residual paralysis, and no cases of nonunion. The mean Pohlemann score for patients observed for more than 6 months was 8.2. **Conclusion:** In polytrauma patients, favorable outcomes were achieved with early surgery for sacral and pelvic ring fractures.

## More than 12% of fragility fractures of the pelvis were initially unrecognized or misdiagnosed

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**Introduction:** Fragility fractures of the pelvis (FFP) are an increasingly common injury seen in the elderly. The clinical symptoms of FFP are frequently vague and nonspecific. In addition, plain radiographs are usually insufficient for the diagnosis. Therefore, accurate diagnosis of FFP is often difficult and consequently delayed. The aim of this study was to determine the rate of occurrence of initially unrecognized or misdiagnosed FFP in our hospital and to evaluate the characteristic findings in those patients. **Materials and methods:** This study was conducted with 409 patients consecutively, aged sixty years and older who were admitted with FFP at our hospital from January 2012 to February 2024. We evaluated the patients who were unrecognized or misdiagnosed at first visit or by previous doctors. **Results:**

Fifty two patients (12.7%) were unrecognized or misdiagnosed initially. Forty six patients were female, and 6 were male. The mean age was 81.9 years (62-99 years). Sixteen patients had no traumatic events and 36 patients had a low-energy trauma, such as domestic falls. It took a mean period of 12.8 days (0-50) to diagnose. According to the Rommens classification, there were 13 type Ia, 2 type Ib, 22 type IIa, 14 type IIc, and 1 type IIIa fractures. Conservative treatment was carried out successfully in all patients. **Conclusion:** It is necessary to consider the possibility of FFP in cases of prolonged pain that can not be explained in elderly patients.

## Robotic-Assisted Percutaneous Ilio-Sacral Screw Fixation for Managing Unstable Vertical Sacral Fracture

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**Introduction:** The third-generation spine robot, conventionally employed for planning and drilling pedicle screw trajectories, is explored in this study for its potential applicability in challenging scenarios beyond conventional spinal anchor placement. **Methods:** A 22-year-old male, post-motor vehicular accident, presented with an open pelvic fracture stabilized temporarily with an external fixator. Subsequent left-sided external hemipelvectomy due to extensive degloving and vascular injury prompted consultation for a right-sided Denis type 2 unstable vertical sacral fracture. Robotic-assisted ilio-sacral screw fixation, following closed reduction, facilitated dynamic patient positioning and pulmonary toileting. **Results:** Two 6.5mm cannulated cancellous ilio-sacral screws were percutaneously placed through the ilium-S1 bony corridor above the S1 foramen using robotic assistance. Transfixing the reduced fracture, the screws achieved a lag effect, enabling the patient to sit with the leg hanging down on the first postoperative day. **Conclusion:** Robotic surgery offers innovative solutions to challenging scenarios, enhances surgeon proficiency, and instils confidence in managing unconventional cases.

## Tilt - pelvic fractures

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Tilt-fractures are displaced fractures of the upper branch of the pubic bone. Non-displaced fractures are treated conservatively, but the available dislocation is an indication for surgical treatment to avoid complications such as subluxation and early arthrosis of the hip joint, especially when the fracture affects the anterior column and the acetabulum wall. Another complication is dyspareunia in women. For a period of three years (2020-2023) at the Clinic of Orthopedics and Traumatology at University Hospital "St. George "we have operated on nine patients with such pelvic pathology. All of them were operated under the condition of delayed urgency between 5-10 days after stabilization of their general condition and correction of blood parameters. Fracture consolidation was achieved with all of them, and a very good functional result. This encourages us to increasingly recommend their surgical solution. The choice of implant for fixation and its placement is strictly individual and in accordance with the relevant clinical case. Key words: Tilt-fracture, pubis bone, dislocation

## Early versus delayed prophylaxis for DVT in Pelviacetabular fractures

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**ABSTRACT BACKGROUND-** Delayed presentation of pelvic-acetabular fractures is a common scenario in developing countries and there is usually a delay of more than 24 hours in their presentation. **OBJECTIVES-** We aim to comparatively analyse early(24 hours) thromboprophylaxis with low molecular weight heparin (LMWH) in prevention of deep venous thrombosis (DVT) in Pelvic Acetabular fractures. **METHODS-** Patients of pelvic-acetabular fractures who presented during 1 year of study period were divided into 2 groups after exclusion of patients with contraindications for thromboprophylaxis. Group A included patients who received LMWH prophylaxis within 24 hours of injury. Group B included patients who received LMWH prophylaxis after 24 hours of injury. All patients underwent CT venography at day 14 and were followed up with doppler ultrasound on 4th and 8th week. **RESULTS-** 110 patients with pelvic-acetabular fractures were included after exclusion of 61 patients. 4 out of 29 patients in group A (13.8%) and 12 out of 81 patients (14.8%) in group B developed DVT. There was no significant difference in incidence of DVT between Group A and B (P value-0.893). **CONCLUSION-** There was no difference between early and delayed thromboprophylaxis with LMWH in pelvic-acetabular trauma.



## Functional outcome of open reduction and internal fixation of unstable floating shoulder injuries: A prospective study of 18 cases with good short- and medium-term outcome

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**BACKGROUND:**The term 'Superior shoulder suspension complex (SSSC)' coined by Goss is a bone and soft tissue stable ring made up of clavicular-acromioclavicular strut, the three-process scapular body and the clavicular-coracoclavicular ligamentous-coracoid(C-4) linkage. Disruption at any one site of the SSSC complex makes the other site unstable in a vicious cycle altering the functional anatomy and muscular forces resulting in a 'Floating Shoulder Injury'. The purpose of this study is to evaluate the functional outcome after open reduction and internal fixation (ORIF) of both clavicle and scapula in FSI using Herscovici and ASES scores. **METHODS:** This is a prospective study conducted at level 1 Trauma Care center in Nagpur, India from May 2019 to May 2023 on 18 cases of unstable FSI. All the cases were followed up post-operatively for a period of 2 years. **RESULTS:** All the injuries were high energy motor vehicular accidents. Fracture union was seen in all cases with mean period of 13.55 weeks for clavicle and 8.5 weeks for scapula on plain radiographs. 72.22 % of the patients had an excellent to good functional outcome assessed by Herscovici scoring system & 61% had an ASES score between 50 -100. No patient had any adverse complication which precluded their return to their daily activities. **CONCLUSION:** Early open reduction and internal fixation of significantly displaced unstable floating shoulder injuries allows early rehabilitation and better functional outcome.

## "Evolution of a Trauma Orthopedic department in a Multilevel Trauma Centre: A 5-Year Experience of Progress, burden and challenges in a Budget-Constrained healthcare system

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Our study aims to assess the advancements, challenges, and burdens experienced within the Trauma Orthopedic Department over five years at the hospital. Methods: This retrospective descriptive cross-sectional study was conducted at the Department of Trauma Orthopaedic Surgery, the study period was from January 2018 to December 2023, and data was gathered from the medical records of the selected patients. SPSS version 21.0 was used to process the data, and a p-value of <0.05 was used as the significance Level. Results: A total of 6513 admitted patients were analyzed, 4934 patients were male (76%) and 1579 female (24%). The mean age was 35.86 years, (SD+/-19), range (1 - 100 years). The most common type of injury was road traffic accidents (RTA) 3489 (53.5%) followed by falls 1400 (21.4%) Firearm injury 1089 (16.7%), assault 289 (4.4%) and crushing injuries 246 (3.7%). Femur fractures were the most frequent 2455 (33.82%) followed by tibia fractures, affecting 1764 (24.3%) of the patients. A total of 7259 surgical interventions were performed, from 2018 to 2023, the number of surgeries increased from 1265 to 1574. Similarly, the yearly admissions surged from 800 in 2018 to 1589 in 2023. Conclusion: The study findings highlight our leading way from a few to thousands of surgical interventions in a brief period, even in low-budget situations. Analysis of the data reveals the substantial burden of trauma encountered by the department. Despite progress challenges including resource shortages, staffing issues, and infrastructure limitations is crucial to ensure the delivery of optimal care to trauma patients.

## A comparative study on anatomical conformation of superior anatomical plate versus a novel plate for fractures in the middle and lateral third junction of clavicle.

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The clavicle is a distinctive bone with S-shaped curvature. Clavicle fractures are common and are usually treated non-surgically. But recently, surgical treatments have become more popular. Various plates used for middle third fractures include a 3.5 mm reconstruction plate, superior clavicular plate, and antero-superior plate. Lateral end fractures can be treated with hook-plate or lateral clavicular locked plates.

Due to variable and complex anatomy with angulations in all three planes, a pre-contoured plate often overhangs during fixation. Earlier studies have highlighted the incongruity of pre-contoured plates in the middle third- lateral third junction of the clavicle. The superior clavicular plate is designed to fit the clavicle only till the lateral clavicular angle. Hence the fixation zone of superior plates is restricted. The use of hook plates for these fractures can cause hook-related complications and need early implant removal. Lateral clavicular locking plates need a higher number of screws leading to increased hardware and costs. Hence, we designed an implant having better conformity for fractures at the middle third-lateral third junction of the clavicle. We determined the ideal zone for fracture fixation with the novel implant compared to superior anatomical clavicle plates. The implant design is based on anatomical bone specimens of 50 clavicles, revalidated on other bone models. There is a 98% match in conforming to the lateral third and medial third junction compared to 78 and 85 percent in superior and anterosuperior plates.

## A case of a Luxatio Erecta and an expectable consequence

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We present a case of a 70-years-old female who went to the hospital after she suffered a fall. She presented pain and functional restriction in the right upper limb, which persisted in a hyperabduction manner (at an angle of 140°). An x-ray was executed which exposed an inferior glenohumeral dislocation with no signs of fracture. A closed reduction was carried out and the joint was immobilized in a sling and an appointment was scheduled in two weeks. The control x-ray showed joint congruence and a rotator cuff arthropathy Hamada Fukuda type III and she was referenced for a physical therapy program (PTP). At four weeks, she had a very low capability for abduction and anterior flexion of the limb and that wasn't expected since she was in a regular PTP. This raised the suspicion of an axillar nerve neuropraxia and a physical exploration exam showed a hypotonic deltoid muscle and a hypoesthesia of the lower deltoid muscle. To confirm the diagnosis an electromyography was asked which showed axillary nerve mononeuropathy with signs of early repolarization. She also did a MRI which showed complete rupture of supraspinatus muscle Patte type III, Goutallier type V. At half a year post reduction and after weekly PTP sessions, the deltoid muscle weakness fully recovered and she could do 90° of abduction. Once, she has now regained full function of deltoid muscle she is in waiting list to do surgery, specifically reverse total shoulder replacement, since she wants to have an active lifestyle like before.

## The effect of using an adjustable arm holder during surgery on the patient's surgical duration and early functional outcomes in proximal humerus fractures

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**Objective:** Our study aimed to investigate the effect of using an adjustable arm holder intraoperatively on the surgical duration and early functional outcomes of patients with proximal humerus fractures. **Methods:** We retrospectively evaluated 34 patients with proximal humerus fractures. Patients were divided into two groups: 18 patients who did not have an arm holder used during surgery and 16 patients in whom an arm holder was used during surgery. All patients were placed in similar positions during surgery. Surgical durations were accessed from patient records. Functional outcomes were assessed using ASES and CONSTANT scores during postoperative follow-up appointments. **Results:** The mean follow-up duration was 2 years, with a minimum follow-up of 1 year. Both groups had similar mean ages and gender distributions. Postoperative ASES and CONSTANT scores were significantly higher in the group where an adjustable arm holder was used compared to the group where it wasn't used. The surgical duration was significantly shorter in the group where an adjustable arm holder was used compared to the group where it wasn't used. **Conclusion:** We didn't find a similar study in the literature to the best of our knowledge. The use of an adjustable arm holder in the treatment of proximal humerus fractures shortens surgical duration and contributes to the improvement of functional outcomes. Our study will pave the way for future research. Larger prospective studies comparing radiological outcomes and long-term follow-ups are needed to confirm these findings and explore the full potential of the adjustable arm holder in orthopedic practice.

## Surgical and clinical challenges in a complex proximal humeral fracture - a case report

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**Introduction:** Proximal humeral fractures (PHF) with diaphyseal extension pose a unique conundrum: choosing the appropriate approach and managing complications remains controversial and is an interesting challenge.

**Results:** A 52-year-old male presented with right shoulder pain following a fall and was diagnosed with a comminuted PHF with metadiaphyseal extension. The patient underwent open reduction and internal fixation (ORIF) with a long locking plate via the deltopectoral approach. Immediately after surgery he showed signs of radial nerve injury and was later diagnosed with brachial plexus lesion. Throughout the post-operative period proper fracture alignment was maintained. At 1 year follow-up and after physiotherapy, he showed improvement of shoulder motion and was able to return to his previous activity level.

**Discussion/Conclusion:** Considering the patient's young age and pre-injury activity our goal was to restore shoulder function: even though shoulder arthroplasty is a popular option, we chose ORIF with a long plate given the fracture's metadiaphyseal extension and in view of a possible rotator cuff integrity.

This was a complex fracture pattern with short calcar segment and disruption of medial hinge – risk factors for avascular necrosis; this was avoided probably due to the patient's lack of comorbidities and a successful anatomic reduction. Iatrogenic brachial plexus injury is rare and we chose a conservative strategy with physiotherapy. Indeed our patient recovered enough motor function to return to his daily activities.

Treatment of complex PHF with plate fixation seems to be a valid and early detection of nerve lesions allows for adequate treatment and improving outcomes.

## The Use of Fluoroscan in Hand Clinic During the Covid Pandemic

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**Introduction** The study assessed the use of Fluoroscan (Hologic, Inc., Marlborough, MA) in hand clinic as advised by the British Orthopaedic Association (BOA) during the COVID-19 pandemic to facilitate treatment of fractures requiring manipulation and reduce admissions to evaluate if this should be embedded in practice permanently. **Method** Eighty-three wrist and hand fractures requiring manipulation were identified between April 2020 and March 2021. Demographics, mechanism of injury, timing of intervention, radiological outcome, further intervention and functional assessment by QuickDASH scoring were recorded. **Results** Sixty-eight cases were manipulated within the first week of fracture, simple pain control measures were used, and dose area product (DAP) averaged 1.3 Gy cm<sup>2</sup> well below the dose limit set by the trust. Satisfactory fracture reduction was achieved in 59 cases avoiding admission. Further surgical intervention was offered to 24 patients: five re-manipulated while 19 had operation, all with a good functional outcome. **Conclusion** Fluoroscan use in fracture clinics achieved effective fracture control in 77% of cases. The use of Fluoroscan avoided admissions for surgery during the pandemic and lengthy clinic visits, four out of five did not need admission.

## Clinical and Radiographical Results of Locking Plate with Medial Support Screw in Proximal Humerus Fracture – The more, the better?

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**Introduction:** This study aimed to assess the outcomes of osteosynthesis for unstable proximal humerus fractures (PHFs) with medial calcar comminution, following treatment with a PHILOS locking plate and medial support screw (MSS). **Materials and methods:** Between January 2010 and December 2018, we retrospectively analyzed the 121 cases of osteosynthesis for PHFs with medial column disruption. To provide medial support, at least one oblique screw was inserted within 5 mm of the subchondral bone in the inferomedial quadrant of the humeral head. All patients were categorized into two groups: 26 patients in the single MSS group, and 95 in the multiple MSS group. Clinical and radiographic evaluations, including Constant-Murley score, UCLA shoulder scale, pain VAS, major complications, NSA, HHH, and bone union time, were assessed after a year. Risk factors for the major complications were also assessed. **Results:** At the final follow-up, between the single MSS and multiple MSS groups, no significant differences in the Constant-Murley score, UCLA score, VAS, time to bone union, NSA loss, and HHH loss were observed. The incidence of complications based on the number of MSS were not significantly different. The initial insufficient reduction after surgery (of NSA<125°) was found to be a significant risk factor for post-surgical complications. **Conclusion:** The use of at least one MSS along with a locking plate system for addressing unstable PHFs is sufficient to achieve satisfactory outcomes. Successful operative treatment using a locking plate for PHF treatment is inherent in anatomical fracture reduction, coupled with medial column support.



## Ilizarov Technique in Treatment of Acute Humeral Fractures And Humeral Shaft Nonunions

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### SUMMARY

**Introduction.** Treatment methods for multiple fractures of the humerus and humeral shaft nonunions have not yet been uniformly adopted anywhere in the world.

**Methods.** A total of 54 patients with different types of fractures and nonunions of the humerus were treated. Of that number, 24 of them (44%) had acute fractures. A total of 30 nonunion fractures (56%) were treated. In the work, we used the methods of clinical follow-up, standard radiographs, CT scan, Stewart-Hundley functional scale after treatment of humeral fracture, and DASH-scoring system after treatment of humeral shaft nonunion.

**Results.** In the treatment of acute fractures, we had complete healing in 22 patients (91.6%). We had prolonged sanation in 2 patients (8.4%). In the presentation of the functional results, we used the Stewart-Hundley scale and according to it, we had 17 excellent, 5 good, and 2 bad results. The results after the treatment of non-union fractures of the humerus were: we recorded complete healing in 27 (90%) cases, while in 3 (10%) cases, non-union occurred. In those three cases, the appliance was re-adjusted, where there were two complete fusions and in one it was not due to wearing intolerance. The mean DASC score was 22.1.

**Conclusion.** Good functional and bony results, minimization of the risk of infection, and great stability of the device give this method a valid place in the treatment of acute fractures and humeral shaft non-union.

**Keywords:** Transosseous osteosynthesis; Ilizarov technique; acute humeral fractures; nonunion of the humerus

## A clinical audit on appropriate utilization of intra-operative fluoroscopy during fixation of distal radius fracture by volar locking plating.

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**Background:**Distal radius fractures are common in orthopedics and can be managed through surgical or non-surgical methods. Open reduction and internal fixation (ORIF) with volar locking plating is a standard surgical approach but carries risks, such as extensor tendon damage and arthritis from screw placement. The literature recommends four essential intraoperative fluoroscopic views (AP, lateral, oblique lateral offset, and dorsal tangential) to avoid these complications. **Purpose:**This clinical audit aims to evaluate the utilization of recommended intraoperative fluoroscopic views during distal radius ORIF with volar locking plating at Our Lady of Lourdes Hospital in Drogheda, Ireland. **Materials & Methods:**The audit was conducted over six months, including patients who underwent ORIF for distal radius fractures. The first cycle (December 2021 to February 2022) included 22 patients, and the second cycle (April to June 2022) had 30 patients. **Results:** Initially, only 4% of surgeons used all four recommended views, while 54% used three views. After interventions, 20% of patients had all views, and 34% had the dorsal tangential view. **Discussion:**Although there was improvement in view utilization, further enhancements are needed. Continuous education and audits can enhance adherence to guidelines and optimize patient care.

## Single versus dual Plating

### Osteosynthesis of Scapular Fractures, a comparative study

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#### Introduction:

The complex anatomy and surgical challenges associated with scapular fractures have traditionally favored conservative treatment. However, studies have indicated that conservative approaches may result in malunion and compromised shoulder function. The efficacy of dual plating versus single plating in treating scapular body fractures has been a topic of debate. This study aims to compare the outcomes of single plating and dual plating for scapular body fractures.

#### Method:

A retrospective analysis was conducted on 28 cases of scapular fixation performed at Show-Chwan Hospital between 2014 and 2019. All surgeries were carried out by a single experienced trauma surgeon. Surgical indications included significant articular step-off or fragmentation, medialization, and substantial angulation. Both single and dual plating techniques were employed.

#### Results:

Both groups demonstrated a return to daily activities with minimal impairment in range of motion. The dual plating group exhibited superior short-term outcomes in terms of Visual Analog Scale (VAS) scores, Disabilities of the Arm, Shoulder, and Hand (DASH) scores within three months, and improved external rotational power at six months. In contrast, the single plating group experienced malunion in 3 out of 16 cases.

#### Conclusion:

Single and dual plating osteosynthesis for scapular fractures yielded satisfactory results and high patient satisfaction in specific cases. Dual plating showed better short-term outcomes in terms of VAS and DASH scores within three months, improved external rotational power at six months, and a lower incidence of malunion compared to single plating.

## Middle-Term: Comparison Of Two Surgical Methods for The Management Of mid–Distal Humerus Fractures Not Involving the Joint (Plate–Screw Osteosynthesis with Elastic Nail-Supported External Fixator Application)

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**Aim:** The open reduction-plate method is frequently used in the surgical treatment of mid-distal humeral fractures. However, the radial nerve is always a problem. In our study, we tried to present a surgical procedure that would eliminate it. For this reason, patients who were operated on for humeral mid-distal fractures in our hospital were investigated. **Methods:** We compared the elastic nail-supported external fixator after closed reduction with plate-screw osteosynthesis after open reduction. Group 1 (32) was divided into elastic nail supported external fixator, Group 2 (78) plate screw osteosynthesis. Groups were analyzed retrospectively. **Results:** While there was no delayed union and no neurological complications in group 1, six patients in group 2 had pseudoarthrosis and four patients had iatrogenic radial nerve deficit. **Conclusion:** There was no significant difference in union times and complication rates. However, in the method we defined; operative time, length of hospital stay were statistically significantly lower. We have also demonstrated advantages of the technique we have described. These; protection of fracture hematoma, no incision scar and plaster fixation, early rehabilitation, ease of removal of implants. Its disadvantage is that the fixator stays on the patient for about three months. We think that the method will become widespread when the advantages and disadvantages of this technique are evaluated. A monolateral external fixator supported by an elastic nail can be used safely, successfully, and easily for the treatment of mid–distal humerus fractures that do not involve the joint.

**Keywords:** Humerus fracture, osteosynthesis, fixator application, plate-screw, radial nerve)

## Arm Wrestling Aftermath: A Distal Humerus Fracture with a Butterfly Fragment - A case report

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Arm wrestling has surged in popularity among young adults. It involves a unique biomechanical pattern characterized by axial pressure loading on the humerus, with a flexed and fixed elbow. This interplay of forces creates a focal stress point, potentially leading to humeral shaft fractures. The most common fracture subtype is a spiral fracture. We report a rare case of an oblique distal humerus fracture, featuring a butterfly fragment, in a 21-year-old healthy male who sustained the injury during an arm-wrestling match. He exhibited a swollen and tender right elbow and arm, with no neurovascular compromise. The x-ray revealed a displaced oblique fracture with a butterfly fragment of the distal humerus. Due to the unusual mechanism of injury, a computed tomography scan was done, confirming an oblique fracture with a single large butterfly fragment. The fracture was treated by open reduction and internal fixation, using a posterior arm approach. The reduction was achieved through the use of 2 lag screws and a LCP posterior plate. During the approach, the radial and the posterior interosseous nerve were identified, showing the immediate proximity of the radial nerve to the typical fracture site. Distal humerus fracture, specially those with a butterfly fragment, associated with arm wrestling are a very rare entity. Between 8% to 12% of patients experience radial nerve palsy with these types of fractures. All patients who present with histories of sudden arm pain after arm wrestling should receive a careful neurologic examination to exclude fracture and prevent misdiagnosis and mismanagement.

## Functional and Radiological Outcome of Corrective Osteotomy with Interposing Tri-Cortical Bone Graft in Malunited Distal End Radius Fracture

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**Introduction:** Distal end radius fractures are one of the most common bony injuries encountered in clinical practice. In our setting, many elderly patients often neglect seeking expert opinion, leading to malunions which lead to significant morbidity in terms of wrist pain, loss of grip strength and restricted mobility. Several methods of restoration of the anatomy and function exists in literature with varying efficacy.

**Methods:** In this prospective case series, 20 patients with malunited distal end radius fractures treated over 2 years were studied. All patients were treated with an open wedge osteotomy along with interpositional cortico-cancellous bone graft taken from the iliac crest and fixed with volar plate. Functional and radiological parameters were assessed pre and post operatively. **Results:** 20 patients with mean age of 59 years were treated with open wedge osteotomy along with interpositional cortico-cancellous bone graft taken from the iliac crest and fixed with volar plate. Radiological union was noted at a mean of 16 weeks. Significant improvement of function along with pain relief noted in all patients following the procedure. Furthermore, significant restoration of anatomy compared to the well hand was noted. No complications were encountered. **Conclusion:** According to our findings, open wedge osteotomy with bone grafting and volar plate fixation is an effective approach towards treatment of neglected distal end radius fractures as demonstrated by functional and radiological outcomes.

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