E POSTER ABSTRACTS
(PAED ORTHO)

APSS-APPOS-MSS 2025 - POSTER

(938) A TALE OF TWO FEMURS: MANAGING CONGENITAL TOTAL FEMUR DUPLICATION

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Introduction: Femur duplication is an exceptionally rare congenital condition characterized by the presence of two femoral shafts within a single limb. This report discusses a case involving a 3-year-old boy with congenital total duplication of the right femur, subluxed knee joints, right fibular hemimelia, and left congenital talipes equinovarus (CTEV).

Case report: A 3-year-old boy presented with a complex deformity in his right lower limb, which included a shortened femur, two subluxed knees, and a malformed, non-functional leg and foot. Radiographs revealed femoral duplication in an anterior-posterior configuration. The anterior femur (femur major) was connected to the hip joint and featured a hypoplastic lateral femoral condyle distally. The posterior femur (femur minor) was shorter, articulating proximally with the greater trochanter of the femur major and distally with a presumed tibia exhibiting fibular hemimelia. Both knee joints were subluxed. The child also had a left CTEV that had previously been treated with serial Ponsetti casting but remained unresolved. Preoperative MRI confirmed the total femoral duplication. Surgical management included excision of the femur minor and the malformed leg, along with a tendon Achilles lengthening procedure. Postoperatively, the patient experienced no complications. Pain control was effective, and distal neurovascular function was intact. By the second postoperative week, wounds had healed, and physiotherapy began to enhance truncal and upper limb strength. The patient has started crawling and is now preparing for prosthetic fitting for his right lower limb stump.

Discussion: Congenital femur duplication, often accompanied by musculoskeletal and vascular abnormalities, necessitates a multidisciplinary approach for optimal management. In this case, preoperative imaging facilitated effective surgical planning, resulting in the successful excision of non-functional structures and initiation of rehabilitation. This highlights the importance of customized surgical interventions, early rehabilitation, and ongoing research to improve outcomes for such complex congenital anomalies. Comprehensive care and close follow-up remain essential to ensure functional recovery and mobility restoration in affected individuals.

(1105) DETERMINING THE BASELINE CLINICAL KNEE MEASUREMENTS IN THE MULTI ETHNIC MALAYSIAN CHILDREN AGED 1 3 YEARS OLD; A POPULATION STUDY

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Background: Genu varus or 'bow leg' is defined as separation of the medial surfaces of the knees when the medial malleoli are in contact. A 'physiologic' genu varus is seen in infants which resolves without treatment around the age of 18 months. If the condition does not improve, a pathologic cause is suspected. The simple clinical methods such as intercondylar distance (ICD) and tibiofemoral angle (TFA) measurement have been used to assess the severity of genu varus.

Objective: This study aims to establish the baseline clinical knee measurements among Malaysian children aged 1-3 years from three main ethnic groups (Malay, Chinese, and Indian). The clinical parameters evaluated include intercondylar distance (ICD), tibiofemoral angle (TFA) and growth-related parameters such as mid-arm and head circumference.

Methodology: A total of 300 healthy children were recruited and divided equally into three age groups. Statistical analyses, including one-way ANOVA for comparison among groups and Pearson correlation to assess the relationships between anthropometric measurements and knee angles, were performed. Multiple linear regression test was used to determine the factor that predicts the severity of TFA.

Results: Results demonstrated significant age-related changes in ICD and TFA. The mean ICD for Malaysian children reduces as they grow older, from 4.88 cm at 0-12 months, to 1.26 cm at 13-24 months and further reduced to 0.16 cm at 25-36 months. While the mean TFA also follows the same pattern with varus angulation of 8.74 degree at 0-12 months, turns neutral with 0.23 degree at 13-24 months and becomes valgus with -4.91 degree at 25-36 months. There was no difference in knee alignment between genders, although Malay children had more varus angulation than other races at age 0-12 months. ICD and height were factors that were found to predict the severity of TFA.

Conclusion: This study provides a reference for evaluating physiological bowlegs in early childhood, contributing to a more informed clinical decision

(1279) LONG TERM OUTCOMES AND COMPLICATIONS FOLLOWING ARTHROEREISIS VERSUS OSTEOTOMY FOR PES PLANOVALGUS CORRECTION IN CHILDREN: DOES CONCOMITANT PROCEDURES ALTER PROGNOSIS?

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Background: Flexible pes planovalgus is prevalent in children, characterised by the loss of the medial longitudinal arch, malalignment of the foot, hindfoot valgus and forefoot adduction. This often causes pain, impacting mobility and daily activities. Surgical options include osteotomies and arthroereisis, but there is a paucity of literature directly comparing their long-term functional outcomes, and the impact of concomitant surgery.

Objective: This study aims to evaluate the long term functional and radiographic improvements of patients undergoing arthroereisis or osteotomy for pes planus.

Methodology: A retrospective review was conducted on pediatric patients who underwent arthroereisis or osteotomy for pes planus from 2012-2024 in a tertiary hospital. Inclusion criteria were patients <18 years old, with flexible pes planus managed surgically. Patients with rigid flatfoot or neurogenic conditions were excluded. Long-term radiographic outcomes (Meary's Angle, Talonavicular Coverage, Talocalcaneal Angles), functional scores (AOFAS, FAAM, VAS), and complication rates were assessed. Patients were followed-up for up to 10 years post-operatively.

Results: 57 patients were included in the study, with a total of 98 feet. 41 patients had bilateral pes planus. 84 feet underwent arthroereisis, and 8 feet underwent osteotomy. No significant long-term differences were found in AOFAS or FAAM scores ($p > 0.05$) between surgical approaches. Pain scores were also comparable between groups ($p > 0.05$), regardless of whether concomitant procedures were conducted. The osteotomy group showed significantly greater correction of Meary's Angle and Talocalcaneal Angle, even on long term follow-up ($p = 0.001$). Other radiographic angles showed no significant long-term differences between procedures on follow-up. Regression analysis also showed that concomitant procedures significantly influenced Meary's Angle in the long term ($p=0.040$) but not functional or pain outcome measures.

Conclusion: Both arthroereisis and osteotomy show comparable long-term functional outcomes, even up to 10-year follow-up. However, osteotomy allows greater sustained radiographic correction of pes planus in the long-term. Diligent peri-operative evaluation is required to determine the benefit of additional concomitant procedures, if required, though overall functional outcomes may not be significantly affected.

(981) LENGTHENING OVER THE PLATE (LOP) FOR PEDIATRIC FOREARM DEFORMITIES: A NOVEL TECHNIQUE TO MINIMIZE EXTERNAL FIXATION TIME

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Background: In various forearm deformities of children requiring bone lengthening, most reports have preferred distraction osteogenesis using an external fixator. This method, however, is associated with prolonged external fixator wear and a high rate of complications. Lengthening over the plate (LOP) has been established as a reliable technique in leg lengthening, as it reduces the duration of external fixation. To date, its application to forearm deformities remains unreported.

Objective: This study introduces the efficacy and safety of the LOP technique in managing forearm deformities in children.

Methodology: Eight patients of forearm deformity (10~18 years old, mean: 12.3) have been treated by LOP technique, including 3 patients of posttraumatic growth arrest and 5 patients of multiple hereditary exostosis. There were seven ulnar lengthening and one radial lengthening patients. The LOP procedure was performed in a staged manner using a monolateral lengthening frame and a locking compression plate.

Results: The amount of lengthening averaged 3.0 cm (range 2.7–3.2 cm). Mean time in the fixator was 51 days, and mean external fixation index was 17.9 days/cm (range 11.3–23 days/cm). All patients achieved a successful healing of distraction callus.

Conclusion: LOP procedure of the ulna or radius may be a reliable technique for treating forearm deformities with its discrepancy in children. This technique significantly reduced the duration of external fixation and its related complications.

(1308) NEGLECTED MONTEGGIA FRACTURE IN CHILDREN: THE NECESSITY OF ANNULAR LIGAMENT RECONSTRUCTION

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Background: Management of missed Monteggia fracture possess a challenge in its management. The current consensus of surgical treatment includes ulna corrective osteotomy with plate osteosynthesis or temporary external fixator while annular ligament reconstruction still being debatable as part of the management as it carries a significant post-operative complications.

Report:
Case 1: 7 years old boy had an injury to the right elbow 5 months prior to his first consultation. A diagnosis of neglected Monteggia (Bado 1) of the elbow was made and he underwent an open reduction of radiocapitellar joint and corrective ulna osteotomy plating with autologous bone grafting. However, the joint was noted to be subluxated post op despite of a transfixing the proximal radio-ulna joint with a k-wire. Revision surgery was conducted at 2 months post initial surgery where remnant of soft tissue apposition was removed and reduction was achieved. A radiocapitellar wire was transfixed for added stability prior to soft tissue repair.

Case 2: 5 years old boy had a fall with right elbow in flexed position, was treated initially with a long arm cast for proximal ulna fracture. The dislocated radial head was missed by the referring center at the initial presentation (Bado 1). He, then underwent corrective ulna osteotomy and plate osteosynthesis together with open radial head reduction supplemented with radioulnar wire at 2 months post trauma.

No annular ligament reconstruction was done for both cases except creating a sling over the radial neck using the triceps fascia and supplemented by temporary transfixed wire to secure the reduction. No dislocation was noted radiologically on follow up even after the plate removal. Full forearm supination and pronation were observed in both patients. The culprit that prevent the radial head to be reduced were remnant of soft tissue, either the annular ligament or joint capsule and once removed it ensure a good joint reduction.

Conclusions: Treatment for missed Monteggia fracture within a year of injury requires no annular ligament reconstruction paired with good clinical outcome.

(752) PAEDIATRIC TB ARTHRITIS LESSONS FROM A CASE SERIES

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INTRODUCTION: In the intricate realm of paediatric tuberculosis (TB), complexities arise. WHO highlighted this, with 1 million pediatric TB cases among 10.4 million worldwide. Unlike adults, children often exhibit extrapulmonary TB. We explore three compelling cases of TB arthritis, revealing diagnostic nuances and clinical hurdles.

REPORT:
Case 1: 9-year-old with Klinefelter syndrome presented with left hip pain and ambulation refusal. His mother had completed anti-TB treatment a year prior. Despite negative TB tests, septic markers were elevated, and ultrasound was inconclusive. Initially treated for transient hip synovitis, symptom relief was short-lived before recurred and radiogrpahs showed osteomyelitis changes. Hip washout uncovered abundant purulent material, with intraoperative samples confirming TB.

Case 2: 7-year-old boy presented with right knee soft tissue swelling. Radiograph and MRI were suggestive of soft tissue tumour and infection. Open biopsy preceeded together with knee washout revealing distal thigh pus collection and thickened synovium. Intraoperative samples were positive for TB. Case 3: 2-year-old girl presented with painless left hip and thigh swelling with unremarkable hip motion for 4 months. Despite mildly raised inflammatory markers, imaging indicated osteomyelitis and intramuscular collection. Hip washout revealed bony erosions and pus collection. IGRA was inconclusive, however intraoperative samples confirmed TB diagnosis.

All patients completed anti-TB treatment successfully but faced sequelae complications. Case 2 developed limb length discrepancy with genu valgum deformity, while the Case 3's growth prognosis remains uncertain pending ongoing follow-up.

CONCLUSION: Our case series reveals the complexity of pediatric TB arthritis diagnosis. Presentation usually chronic as early symptoms were mild and subtle. MTB PCR usually a reliable investigation. Despite successful treatment, lingering sequelae emphasize the importance of vigilant follow-up and comprehensive management for long-term patient outcomes.

(1173) COMPLEXITIES OF PEDIATRIC NONUNION SHAFT FEMUR FRACTURE IN AN OBESE PATIENT WITH VITAMIN D INSUFFICIENCY: A CASE REPORT

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Background: Nonunion fractures in pediatric patients are uncommon, particularly without underlying medical issues. This case report describes a rare nonunion femur fracture in an 11-year-old with obesity and Vitamin D insufficiency. Despite multiple surgeries, similar nonunion and implant failures occurred. It underscores the difficulties in identifying causative factors, along with management challenges faced.

Report: The patient, an 11-year-old boy with a BMI of 25.6 kg/m2, sustained a closed oblique fracture of the left femur midshaft (AO/OTA 32A2) in a motor vehicle accident. He had no prior medical history. A locking compression plate fixation via a subvastus-lateralis approach was performed on day 2 post-trauma. At 3 months post-fixation, radiographs showed signs of atrophic nonunion with no callus formation, despite the intact plate and screws. The surgical wound healed well, and infective markers were normal. During 4-month follow-up, the patient presented with a bending plate over the fracture site.

The patient underwent replating of the left femur with a longer 16-hole broad locking plate. Intraoperative cultures were negative. At 6 months post-surgery, similar atrophic nonunion with implant failure was observed. Metabolic assessments were normal except for Vitamin D insufficiency, 58.29 nmol/L.

The patient received D-Cure supplements (25,000 IU Vitamin D3) biweekly for 6 weeks. Congenital endocrine and bone metabolic disorders were ruled out. Limb Reconstruction System (LRS) and iliac bone grafting was conducted. Culture samples were negative. At 3 months post-LRS, fracture united.

Conclusion: Biological factors play role in fracture union. Brinker et al. suggested a detrimental effect of Vitamin D deficiency on fracture healing. According Gorter E.A et al., the incidence of delayed union was higher in the group that remained vitamin D deficient. Tauber et al. suggested that deficiency might result from increased consumption of vitamin D metabolites during the process of delayed union.

Samuel et al., obesity has longer union times regardless of fracture configuration. Obesity also increases the operative time which contributes to higher surgical complications and costs.

(1411) CHONDROSARCOMA SCREENING GUIDELINES IN PATIENTS WITH MULTIPLE HEREDITARY EXOSTOSIS: A SYSTEMATIC REVIEW

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Background: One of the most serious complications of multiple hereditary exostosis (MHE) is the risk of malignant transformation to chondrosarcoma.

Objective: The purpose of this study was to perform a systematic review of the literature to inform a Delphi consensus on the development of screening guidelines for malignant transformation in MHE. Secondary aims included identifying the rate of malignant transformation to a secondary chondrosarcoma, identify risk factors for malignant transformation, and reviewing existing chondrosarcoma screening programs

Methods: A systematic review was performed utilizing MEDLINE, Embase, and PubMed databases. Abstract screening and full text review were undertaken in tandem by two independent reviewers (AA, RS). Discrepancies were resolved through consensus. Clinical or genetic studies reporting on the incidence of secondary chondrosarcoma, risk factors for developing secondary chondrosarcoma, and/or screening protocols for early identification of secondary chondrosarcoma in patients with MHE were included.

Results: The literature search identified 877 studies, of which 28 were selected for full text review. A total of 5,579 patients with MHE were identified, and 386 developed a secondary chondrosarcoma. Malignant transformation rates ranged from 0-36.3% per patient. Amongst reporting studies, the mean age of malignant transformation was 32.7 and 56.9% of patients were male. The most common location of a secondary chondrosarcoma was the pelvis (n=137, 49.8%). An EXT1 mutation was identified in 60.8% of patients and an EXT2 mutation was identified in 31.7% of patients who developed a secondary chondrosarcoma in studies that included genetic analysis (n=6). Four studies reviewed existing screening protocols including two utilizing whole body MRI, one using bone scintigraphy, and one using multi-detector CT. Qualitative analysis of these methods is ongoing.

Discussion: Early diagnosis of secondary chondrosarcoma in MHE is critical to reducing morbidity and mortality. A wide range of malignant transformation rates were identified. The findings of this study will inform a Delphi consensus to develop internationally agreed upon clinical practice guidelines regarding the screening of patients with MHE for chondrosarcoma.

(936) SURGICAL INTERVENTION IN CONGENITAL PSEUDOARTHROSIS OF THE CLAVICLE: A RARE CASE REPORT AND REVIEW OF OUTCOMES

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Background: Congenital pseudoarthrosis of the clavicle (CPC) is a rare entity, with 200 cases reported worldwide so far. It is defined as a bone defect of the middle third of the clavicle due to the failure of the union process of the ossification nuclei of the clavicle, commonly occurs in the right clavicle. Most often, CPC first noted at birth or in early childhood; it presents as a painless mid-clavicular mass. Radiographs demonstrate a mid-clavicular large bone gap with sclerotic ends and no callus.

Case Presentation: We report a case of a 6-year-old boy with a right mid-clavicular painless mass whose clavicular radiograph and computed tomography revealed discontinuity of the right clavicle pars tertia media with bulbous, partial displace, well corticated borders and no callous formation in favor of a CPC. We treated the patient with internal fixation using reconstruction plate and iliac autograft. Our patient showed favorable clinical and radiological outcome also yields minimal complications and improves aesthetics.

Discussion: There have also been cases of patients managing CPC conservatively and who later developed thoracic outlet syndrome and vascular complications in adulthood. For these reasons, surgical management is a widely accepted treatment of CPC. Operative options consist of pseudoarthrosis resection and excision, fixation (external or internal), with or without bone grafting. The two primary methods of internal fixation involve the use of reconstruction plates or K-wires. Outcomes following CPC have been good, especially considering the union of the clavicle site is generally slow.

Conclusion: Our experience revealed that scheduled surgical treatment in six years of age with iliac bone autograft and plate fixation are reliable with favorable clinical and radiological outcome. Our patient also yields minimal complications and improves aesthetics.

Keywords: Congenital, Pseudoarthrosis, Clavicle, Surgical

(951) SPLIT ANTERIOR TIBIALIS TENDON TRANSFER (SPLATT) & ACHILLES TENDON LENGHTENING AS A COMPREHENSIVE MANAGEMENT OF SYNDROMIC CTEV CASE REPORT

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Background: Congenital Talipes Equinovarus (CTEV), commonly known as clubfoot, is a complex deformity that can occur in isolation or as part of a syndromic condition. Syndromic CTEV is often resistant to conservative treatments like the Ponseti serial casting method due to underlying neuromuscular or connective tissue abnormalities. Surgical intervention, such as Split Anterior Tibialis Tendon Transfer (SPLATT), may be required to achieve optimal correction and improve functional outcomes in syndromic CTEV.

Report: We report the case of a 5-year-old child with syndromic CTEV due to bifid spine who presented with persistent deformity despite undergoing the Ponseti method. The patient exhibited significant residual adduction, inversion, and equinus deformities, which impaired cosmetic and daily activities. Surgical correction involved a combined approach: a Split Anterior Tibialis Tendon Transfer (SPLATT) to the peroneus tertius, wherein the anterior tibialis tendon was split and transferred to the peroneus tertius tendon to address dynamic imbalance, and Achilles tendon lengthening to correct equinus and soft tissue contractures. Postoperative evaluation revealed significant improvement, with the foot deformity corrected to within normal limits. Functional outcomes were favorable, with improved functional capabilities, correction of deformity, and satisfactory cosmetic appearance. Post operative we applied cast for 3 weeks and continue with AFO. Rehabilitation and follow-up over six months confirmed the maintenance of correction without recurrence or complications.

Conclusion: This case highlights the role of combined surgical techniques, including SPLATT and Achilles tendon lengthening, in managing syndromic CTEV when conservative treatments fail. The comprehensive surgical approach effectively addressed both dynamic and structural deformities, resulting in excellent functional and cosmetic outcomes. Early recognition and timely surgical intervention are crucial in improving the quality of life for children with syndromic CTEV.

(961) DEVELOPMENT AND VALIDATION OF A THREE DIMENSIONAL RECONSTRUCTION TOOL OF THE PELVIS USING AN UNCALIBRATED UNIPLANAR IMAGE

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Background: The statistical shape model for the femur and the lower leg have been developed and completed validation. The evaluation of the acetabuli is usually carried out by three-dimensional (3D) reconstructed image of computed tomography. The pelvis presents a challenge for 3D reconstruction using statistical shape model: in clinical setting, the lateral radiographs are rarely taken due to overlap of two hemi pelvis. Therefore, three-dimensional reconstruction can only be performed with anteroposterior (AP)-view X-rays. In addition, presence of triradiate cartilage, which is an area of three innominate bones conjoined together, poses another challenge in accurate reconstruction and evaluation.

Objective: The aim of the study was to develop and complete reliability and validity testing of the statistical shape model that enables successful three-dimensional reconstruction of the pelvis using a single AP image.

Methodology: A statistical shape model was used, but with different type of programming mesh. A novel spread-out mesh technique was adopted for accurate reconstruction of the triradiate cartilage. Reliability and validity testing were conducted with four indices of the acetabulum.

Results: A 3D reconstruction tool that can construct a 3D image of the pelvis with only an AP-image was developed. Reliability and validity testing were conducted on 36 and 122 patients respectively. The application showed good validity in assessing supero-lateral index and pelvic anteversion ($R=0.71$, $p=0.00$, $R=857$, $p<0.0001$) and good to excellent reliability in measuring pelvic parameters.

Conclusion: A 3D reconstruction tool that can construct a 3D image of the pelvis with only an AP-image was developed.

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(991) CHALLENGES IN MANAGING PEDIATRIC NON UNION MEDIAL MALLEOLUS FRACTURE LEADING TO OVERGROWTH OF DISTAL FIBULA AND PROGRESSIVE VARUS DEFORMITY

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Background: Patient S, a 6-year-old child, presented in February 2016 with progressive varus deformity of the ankle and inability to bear weight following an open ankle fracture sustained five months earlier. Examination revealed varus deformity and a healed scar over the ankle. Radiographs showed varus deformity, lateral malleolar overgrowth, and obliquity of the distal tibial growth plate due to growth imbalance. A CT scan confirmed physeal bar formation at the medial distal tibial growth plate.

Case Report: The patient initially underwent a supramalleolar osteotomy, epiphysiolysis of the medial tibial growth plate with defect filling using bone wax, and fixation of a medial malleolus non-union. Despite this, recurrent varus deformity was noted one year later. Guided growth of the lateral malleolus and removal of the medial malleolus K-wire were performed, though no union of the unossified medial malleolus was seen radiographically. Recurrent deformity persisted due to distal fibular overgrowth despite three additional surgeries from October 2017 to September 2018.At age 9, an X-ray revealed a non-union of the ossified medial malleolus with varus instability. Definitive surgery using bone grafting and tension band wiring with K-wires achieved union of the medial malleolus, resolving the varus deformity without recurrence.

Discussion: This case highlights the challenges of managing a complex distal tibial varus deformity. The initial difficulty in differentiating between medial physeal arrest and medial malleolus non-union delayed definitive treatment. The non-union contributed to varus deformity by exerting traction on the lateral malleolus growth plate, leading to overgrowth. The precarious skin condition overlying the fracture site rendered simple K-wire fixation ineffective, further complicating management. Delayed diagnosis of the non-union allowed the deformity to progress, necessitating multiple interventions.

Conclusion: Definitive treatment using bone grafting and tension band wiring successfully achieved union of the medial malleolus. Preservation of blood supply facilitated growth and ossification, resolving the varus deformity without recurrence. This case underscores the importance of early diagnosis and precise surgical techniques in addressing complex deformities.

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(843) PROGRESSIVE OSSEOUS HETEROPLASIA : INSIGHTS INTO PEDIATRIC ORTHOPEDIC RESEARCH TRENDS AND GENETICS PATHOPHYSIOLOGY : A BIBLIOMETRIC ANALYSIS STUDY

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Background: Progressive Osseous Heteroplasia (POH) is an exceptionally rare genetic disorder characterized by abnormal ectopic bone formation due to inactivating mutations in the paternal GNAS gene. GNAS gene, which encodes the Gsα protein, is the major cause of POH. However, the pathophysiological processes behind ectopic bone formation in POH are still understudied. Despite over three decades of research, the number of cases reported remains exceedingly limited, and an effective therapy is still absent. As a result, bibliometric analysis is essential for mapping research trends, discovering knowledge gaps, and promoting collaboration, especially in fields that have limited resources and literature.

Objective: This study aims to conduct a bibliometric analysis of the existing literature on POH. This analysis aims to identify genetic pathophysiology and effective treatment and analyze research trends related to POH.

Methodology: This bibliometric analysis is created to explore research trends in Progressive Osseous Heteroplasia (POH), analyzing 83 articles via Scopus. Tools such as the bibliometrix R package and VOSviewer enabled structured visualization and network mapping. Thematic clustering, co-authorship, co-occurrence, and citation analyses revealed key trends, providing valuable insights into the intellectual framework and research dynamics of POH studies.

Results: The bibliometric analysis of 83 publications from 1994 to 2024 on Progressive Osseous Heteroplasia (POH) reveals significant research contributions from 332 authors across 59 journals. Despite a declining annual growth rate, Progressive Osseous Heteroplasia (POH) research continues to grow every decades, with the United States leading in output, followed by China and Italy, though international collaboration, particularly in Asia, remains limited. Keyword analysis revealed a strong focus on genetic and pathophysiological aspects while demographic keywords indicate attention to younger populations. Visualizations using VOSviewer identified thematic clusters and trends, offering insights into emerging research priorities and underexplored areas in the field.

Conclusion: This bibliometric analysis underscores the need for global collaboration and interdisciplinary research to advance POH diagnostics and therapeutic strategies.

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(923) WHEN COMPETITION TURNS RISKY : A CASE SERIES OF MEDIAL EPICONDYLE FRACTURE IN ADOLESCENTS FROM ARM WRESTLING.

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Humeral medial epicondyle fractures account for up to 12-20% of elbow fractures in paediatric and adolescents populations, with 60% associated with elbow dislocations. Isolated injuries can occur from direct trauma or avulsion. We present a case series of medial epicondyle fractures, its diagnostic challenges and treatment.

Report: We report two cases of similar presentation, both patients were male and aged 15 and 17 respectively. Both were in an arm-wrestling competition with friends and were in winning position whereby their arms were internally rotated and wrists flexed. Both patients heard a click sound and subsequently felt pain and were unable to fully extend the elbow. Upon presentation at the emergency department, radiographs revealed an avulsion fracture of the humeral medial epicondyle. An above elbow splint was used for provisional stabilization, prior to screw fixation of medial epicondyle.

Discussion: The medial epicondyle humerus fracture is common amongst teenagers. Although direct impact is the primary cause, forceful traction of the attached flexor-pronator muscles can result in an avulsion fracture. In arm wrestling, the arm position will be in internally rotated, and wrist flexed, hence it induces a tractional force on the flexor-pronator apparatus which may result in an avulsion fracture at the medial epicondyle. Medial epicondyle is the last distal humerus ossification center to fuse at age 15-20, hence predisposing to fractures. Furthermore, adolescents of these age are less risk averse ergo increasing the likelihood of this occurrence. Despite having good, outcomes conservative treatment has shown high rates of non-union, therefore initial immobilization followed by early screw fixation was done.

Conclusion: Medial epicondyle fractures in adolescents can result from the tractional forces exerted at the origin of flexor-pronator muscles during activities such as arm wrestling, whereby the arm is internally rotated & wrist flexed. A high index of suspicion coupled with thorough examination and history taking is important to avoid missing such diagnosis and potentially devastating complications.

Reference: 1. Rubini Pathy et al, Curr Opin Pediatr, 2015 Feb;27(1):58-66.

(1100) IPSILATERAL FEMORAL NECK FRACTURE WITH SHAFT FRACTURE IN PAEDIATRIC PATIENT: WHICH ONE WOULD YOU ADDRESS FIRST?

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Background: Ipsilateral femoral neck fracture with shaft fracture is a very rare injury in the pediatric population. Surgical intervention is the most appropriate treatment and should be performed as early as possible especially reduction and stabilization of femoral neck fracture to reduce risk of avascular necrosis of the femoral head, coxa vara deformity and leg length discrepancy. In adults, simultaneous fixation of the femoral shaft and neck fractures can be achieved with a single intramedullary nail. However, in pediatric patients whose physes remain open, it is not recommended to fix these concomitant fractures with rigid intramedullary nails through or near piriform fossa because of increased risk of avascular necrosis of the femoral head. Instead, combined internal fixations are recommended. The order of fracture reduction and internal fixation commonly begins with shaft fracture followed by femoral neck fracture as stabilizing the shaft will aid with traction during reduction of femoral neck fracture. However, there has been concerns that the femoral neck fracture may get further displaced during the manipulation for the shaft fracture, thus causing more damage to

already tenuous blood supply to the femoral epiphysis following trauma. Initial provisional fixation of a relatively less displaced neck fracture with guide wires has been recommended to prevent further displacement followed by definitive stabilization of the shaft fracture and finally reduction and definitive stabilization of neck fracture later with the patient in supine position.

Report: In our case report, we will evaluate the surgical and functional outcomes of our preferred choice of managing such injuries in a pediatric patient, in that we had performed open reduction and plating of the femoral shaft fracture with the patient in lateral decubitus position followed by reduction of femoral neck fracture and screw fixation with patient in supine position. Our patient demonstrated good fracture healing and no complications following surgery.

Conclusion: As such, we are of the opinion that the order of fracture fixation in ipsilateral femoral neck fracture with shaft fracture depends on which the surgeon thinks will aid with fracture reduction and stabilization.

(1186) CORONAL OBLIQUITY IN SUPRACONDYLAR HUMERAL FRACTURE OF CHILDREN MIGHT RESULTED IN SUBOPTIMAL REDUCTION AND ELBOW STIFFNESS A RETROSPECTIVE CASE CONTROL STUDY

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Background: Supracondylar humeral (SCH) fracture is one of the most common fractures in pediatric group. The treatment principle for Gartland type III or IV is closed or open reduction and fixation with percutaneous pinning to achieve optimal reduction and functional outcomes. However, there is still controversy among the fracture severity, the quality of reduction, the fixation techniques and the functional outcomes.

Objective: We retrospectively review patients with SCH fractures in 2016-2022 and who were aged between 3-12 y/o in single tertiary trauma center. Totally 88 patients with Gartland type III, IV SCH fractures were recruited.

Methodology: Coronal obliquity was assessed by measuring the angle between the axis of the humeral shaft and the plane of the SCH fracture in the elbow's A-P view, patients with coronal obliquity exceeding 10 degrees were categorized into the coronal oblique group. The patients with the Bauman angle below 60 degrees or above 80 degrees in A-P view, and the anterior humeral line (AHL) without intersects with the ossification center of the capitellum in the lateral view, were classified as reduction outlier. The ratio of metaphyseal overhang in the lateral view is more than 1.2 or less than 0.8, was classified as malrotation. If a repeat surgery to adjust reduction is necessary within one month after the initial surgery, it will be categorized as a loss of reduction. If the range of motion of the elbow joint does not reach 80% of that on the contralateral side after two months following surgery, it will be classified as elbow stiffness.

Results: The Transverse group consists of 52 individuals, and Coronal Oblique group comprises 36 patients. There were more reduction outliers in Coronal Oblique group then in Transverse group, especially AHL without intersects with capitellum($p = 0.0132$) and malrotation ($p = 0.0079$). There were more cases encountered with loss of reduction and elbow stiffness after initial surgery in Coronal Oblique group compare with Transverse group.

Conclusion: Through this retrospective study, we found that coronal oblique supracondylar fractures are more likely to result in reduction outliers, loss of reduction after closed pinning, and elbow stiffness after surgery.

(1230) CONGENITAL PATELLAR DISLOCATION IN A ONE MONTH OLD INFANT: A CASE REPORT

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Background: Congenital patellar dislocation (CPD) is a rare congenital anomaly characterized by permanent lateral displacement of the patella, typically identified at birth or during early infancy. Unlike acquired patellar dislocations, CPD is associated with femoral hypoplasia, quadriceps contracture, and trochlear dysplasia. Early diagnosis and intervention are essential to prevent long-term complications such as impaired ambulation and knee dysfunction. Here, we present a case of CPD in a one-month-old infant managed with early intervention.

Report: A one-month-old female infant was brought to the orthopedic clinic due to concerns about restricted knee extension and an unusual prominence at the lateral aspect of both knees since birth. Clinical examination revealed fixed lateral displacement of the patella, limited active knee extension, and tightness of the quadriceps. Radiographic and ultrasonographic evaluation confirmed the diagnosis of bilateral congenital patellar dislocation, showing a laterally displaced patella with a shallow or absent trochlear groove. Given the early diagnosis, a conservative approach with serial casting and passive stretching exercises was initiated to improve knee extension and patellar positioning. Despite initial improvement, surgical intervention involving quadriceps lengthening, lateral release, and medial plication was required at six months of age to optimize patellar tracking. Postoperative follow-up demonstrated improved knee alignment, functional mobility, and full extension.

Conclusions: Early recognition of congenital patellar dislocation is crucial for initiating timely intervention to optimize functional outcomes. While conservative management may be effective in selected cases, surgical correction remains necessary in cases with persistent patellar malalignment. This case underscores the importance of a multidisciplinary approach in managing CPD to restore knee function and prevent long-term disability

(1243) EXTENSOR POLLICIS LONGUS RUPTURE RARE COMPLICATION OF POST DORSAL APPROACH ELASTIC STABLE INTERNAL NAILING OF RADIUS

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Forearm fractures are the most common fractures in paediatric population, sometimes requiring elastic stable internal nailing (ESIN) based on angulation, displacement, and patient age. Complications are rare but include superficial branch of the radial nerve (SBRN) injury, extensor pollicis longus (EPL) tendon rupture, wound infection, hematoma, refracture, and ulnar/median nerve injury.

An 11-year-old boy (AZ) fell while skateboarding in February 2024, sustaining a closed midshaft fracture of the right radius and ulna. ESIN fixation was performed via a dorsal approach at Lister's tubercle for the radius and a distal ulnar entry for the ulna. Surgery was uneventful. However, two months postoperatively, the patient developed sudden thumb extension loss while playing pétanque, without pain, trauma, or swelling. Ultrasound revealed focal tenosynovitis of the EPL due to ESIN compression. Upon implant removal after fracture healing, intraoperative findings confirmed EPL rupture with no identifiable proximal or distal stump. The patient remained unable to extend the thumb postoperatively and undecided for further intervention for EPL rupture.

Two ESIN insertion techniques exist: the dorsal approach near Lister's tubercle and the distal radial approach proximal to the growth plate. EPL rupture is a unique complication of the dorsal approach, while the distal radial approach risks SBRN injury. A study by Cintean et al. compared both techniques, showing low complication rates but a higher risk of EPL rupture with the dorsal approach and SBRN injury with the radial approach. The study recommended the radial approach due to fewer complications requiring further surgery. This case represents the only EPL rupture post-ESIN in recent years at our center. While rare, the risk should be highlighted preoperatively for informed consent, and the radial approach may be considered to reduce EPL injury risk.

(1286) FIXING FLATFOOT: A SHORT TERM COMPARISON OF ARTHROEREISIS VS. OSTEOTOMY FOR PES PLANOVALGUS IN CHILDREN

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Background: lexible pes planovalgus is a prevalent condition in children, characterised by loss of the medial longitudinal arch, foot malalignment, hindfoot valgus, and forefoot adduction. This often causes pain, impacting children's mobility and daily activities. Various surgical options, including osteotomies and arthroereisis, have been described for pes planus correction. This study aims to compare early post-operative functional scores, pain levels, and radiographic outcomes between these two surgical approaches, and effect of concomitant procedures on post-operative outcomes.

Methods: A retrospective review was conducted on paediatric patients who underwent arthroereisis or osteotomy for pes planus from 2012-2024 in a tertiary hospital. Inclusion criteria were patients <18 years old, with surgically managed flexible pes planus. Patients with rigid flatfoot or neurogenic conditions were excluded. Short-term outcomes (≤2 years) were assessed using American Orthopaedic Foot and Ankle Midfoot Score (AOFAS), Foot and Ankle Ability Measure (FAAM), and Visual Analogue Scale (VAS), alongside radiographic angles (Meary's, Talocalcaneal, and Talonavicular Coverage). Complication rates were compared, and effect of concomitant procedures (e.g. gastrocnemius recession and/or accessory navicular excision) was analysed using subgroup and multivariate regression models.

Results: 57 patients were included, totalling 98 feet. 41 patients had bilateral pes planus. 84 feet underwent arthroereisis, and 8 underwent osteotomy. Short-term pain levels were similar between groups. However, patients with concomitant procedures reported significantly higher early post-operative pain ($p = 0.007$). No significant differences in early post-operative AOFAS and FAAM scores were found between groups ($p > 0.05$).

Both groups showed significant improvement in radiographic correction of pes planus, with osteotomy showing significantly greater correction of Meary's and Talocalcaneal angles ($p = 0.001$). Arthroereisis had a higher rate of minor complications, including subtalar pain, joint swelling and gait alterations compared to osteotomy. Multivariable regression showed that concomitant procedures significantly influenced early pain scores ($p = 0.007$) but had minimal impact on radiographic outcomes.

Conclusion: Arthroereisis and osteotomy were comparable in short-term functional recovery, but osteotomy conferred slightly greater sagittal correction of pes planus deformities. These findings suggest that the degree of hindfoot deformity and correction required should be assessed pre-operatively to guide the surgical approach for pes planus correction.

(1385) REDUCTION OF RADIAL HEAD IN CHRONIC MONTEGGIA FRACTURE DISLOCATION USING A HEXAPOD EXTERNAL FIXATOR

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Background: Chronic Monteggia fracture (CMF) often gets missed, due to subtle appearance on the radiograph, which most commonly could be just from plastic deformation of the ulna. Usage of Hexapod External Fixator (HEF) is considered to be rarely used in this complex injury management. Here we are reporting a case of CMF which was treated with HEF and has obtained good radiographic radial head reduction.

Report: A 10-year-old boy, presented with pain and deformity at his right elbow for 3 months in which he sustained trauma to his right elbow while playing. Child was brought to a medical center was then diagnosed with soft tissue injury since there was no noticeable fracture on a radiograph. However, the deformity persist despite resolution of the pain.

On examination at our center, child had deformity at right elbow with loss of normal valgus carrying angle. The radial head was palpable antero-medially just distal to elbow crease with no tenderness surrounding the region. Range of movement was limited as well.

Plain radiograph was done, showed antero-medial dislocation of the radial head with plastic deformation of the proximal ulna. Distraction osteogenesis using a HEF was done, and reduction of radial head was successfully obtained after 8 weeks of distraction.

Conclusion: In the hands of trained surgeons, the use of HEF is an alternative management of CMF, which can result in satisfactory radiological and clinical outcomes.

(838) ROLE OF 3 D PRINTED MODELS FOR COMPLEX PAEDIATRIC CRANIOCERVICAL JUNCTION CONDITIONS: A CASE DESCRIPTION

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Background: Paediatric craniocervical junction (CCJ) anomalies consist of a unique subset of anatomically complex spine conditions. In children with congenital CCJ pathologies, the aims of intervention are to achieve long-term stability, correct existing deformity and prevent neurological compromise. However, surgery is challenging due to critical neurovascular and musculoskeletal structures in a limited operative space of a young child. Recently, the use of three-dimensional (3D) printed models in neurosurgery has been demonstrated to be valuable adjuncts for better visuospatial planning of selected regions of interest and hence, reducing operative morbidity. We therein report the application of a bespoke 3D-printed model for a paediatric case with a complex CCJ condition.

Report: A previously well 10-year-old male presented with torticollis associated with neck pain and progressive thoracic kyphosis. Neuroimaging reported an unfused os odontoideum inferior to the basion and anterior half of the C2 vertebral body and anteriorly angulated with the C1 anterior arch. There was widening of the atlantoaxial interval consistent with atlantoaxial subluxation. No acute fracture or facetal subluxation was present. Of note, the C2 dens was hypoplastic with a bony prominence which protruded into the spinal canal causing indentation of the cervical spinal cord. Additional computed tomographic angiography scans did not show any vertebral artery anomaly. However, there was a large vertebral vein coursing over the left C2 lamina that was predominantly draining into the CCJ venous plexus. A radiologically-derived 3D model of the patient's CCJ was printed and used for pre-operative planning, multi-disciplinary team discussion and detailed counselling with the patient and caregivers. Technical nuances included size and trajectory of laminar screws, approach to safe reduction of the CCJ and avoidance of important blood vessels during the surgery. The patient underwent an uneventful C1-C2 posterior screw fixation and has recovered well since.

Conclusions: As demonstrated in our patient, a personalized 3D model was useful for clinicians work through technical difficulties and improve the perioperative discussion process in an otherwise complex case.

(1229) HEMI EPIPHYSIODESIS VERSUS CORRECTIVE OSTEOTOMY – A SYSTEMATIC REVIEW ON SURGICAL APPROACHES FOR JUVENILE BLOUNT'S DISEASE

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Background: Blount's disease is a condition characterised by disordered endochondral ossification which mainly affects the medial part of proximal tibial physis . Blount's disease can be further categorized into three types depending on the age of onset – infantile (0-3 years), juvenile (3-10 years) and adolescent (after 10 years). Common treatments for Blount's disease are bracing, osteotomy, hemi-epiphysiodesis with tension band plate depending on patients' age and severity of deformities. Patients with Juvenile Blount's can still have significant growth potential due to skeletally immaturity, therefore making the decision between osteotomy or guided growth a controversial topic.

Objective: The objective of our study is to compare the two most common surgical approaches for juvenile Blount's disease – hemi-epiphysiodesis versus corrective osteotomy.

Methodology: Using the PRISMA guideline, a systemic search was conducted on PubMed and Embase databases for observational studies on hemi-epiphysiodesis or osteotomy for Blount's disease in patients aged between 3 to 10 years. We compared outcomes including correction rate, recurrence rate and complications for both approaches.

Results: 18 studies met our inclusion criteria, among which 12 studies are on guided growth, 4 studies on osteotomy and 2 studies compared both approaches. Our systemic review showed that both guided growth and osteotomy can be considered in juvenile Blount's disease but at early stages of juvenile Blount's, guided growth was superior as it yielded better outcomes including higher correction rate, lower recurrence rate and it was less invasive compared to osteotomy. Common complications identified by the studies for hemi-epiphysiodesis are screw breakage and overcorrection. Most studies showed high correction rate by hemi-epiphysiodesis, and correction failure was observed in patient with abnormal physes.

Conclusion: Hemi-epiphysiodesis should be considered over osteotomy for juvenile Blount's disease especially among those with unfused physes as it allows faster recovery and minimal post-operative activity limitation. However, due to limited quality of evidence, definitive conclusions regarding optimal surgical approach for Blount's cannot be drawn.

APSS-APPOS-MSS 2025 - POSTER

(1164) FIVE YEAR OLD BOY WITH ANAPHYLAXIS REACTION TO GADOLINIUM BASED MR CONTRAST MEDIA: A CASE REPORT

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Background: Magnetic resonance imaging (MRI) is one of the most widely used tests in orthopedic areas. Gadolinium-based magnetic resonance (MR) contrast media, a contrast medium used for MRI tests, is known as a safe formulation with little side effects due to its low incidence of acute adverse reactions. Although not common, immediate hypersensitivity reaction can occur in some patients after administration of gadolinium-based MR contrast media, causing skin rash, vascular edema, dyspnea, abdominal pain, hypotension, altered mental status, cardiopulmonary arrest, and even death.

Report: A 5-year-old boy developed anaphylaxis after after gadolinium-based contrast media injection during knee joint magnetic resonance imaging, despite prior uneventful CT contrast exposure. 10 minutes post-injection, he experienced dizziness and lethargy, followed by severe dizziness, abdominal pain, headache, and vomiting. He was moved to the emergency room with suspected anaphylaxis. He had hypotension (80/40 mmHg) and tachypnea (RR 32), requiring epinephrine, dopamine, norepinephrine, and oxygen therapy. Pulmonary edema developed but improved with treatment. He was discharged on day 4 without complications.

Conclusions: Severe anaphylactic reactions to gadolinium-based MR contrast media are rare (0.008%) but life-threatening. Symptoms can appear immediately or within hours. Patients with asthma/allergies have increased risk, and 30% of hypersensitivity cases recur. Anaphylaxis must be distinguished from vasovagal reactions and requires rapid diagnosis and treatment with epinephrine, oxygen, and IV fluids. MRI poses monitoring challenges, especially in sedated children. Medical staff, patients, and guardians should be educated to recognize symptoms and seek immediate medical help.

(1234) THE ROLE OF SURGERY IN THE MANAGEMENT OF ACUTE HEMATOGENOUS OSTEOMYELITIS : EFFECT OF ANTIBIOTIC PRETREATMENT ON CULTURES IN PEDIATRICS

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Background: invasive infection in children with the potential for substantial morbidity including the development of chronic infection, growth arrest, sepsis and pathologic fracture. Drainage of septic material in bones provides specimens for culture as well as therapeutic benefit.

Objective: Purpose of this study is to analyze the influence of antibiotic timing on surgical culture yield in children with AHO.

Methodology: A retrospective review of cases of AHO aged less than 18 years was performed from 2010 to 2019. A total of 60 cases met inclusion criteria. All patients had both blood and "other" culture samples. "Other" cultures were cultures from wound, abscess, soft tissue, bone or joint fluid collected from operative site for culture. Patients with malignant disease, underlying bone disease, osteomyelitis caused by mycobacterium or fungus, orthopedic hardware, puncture wounds, and septic arthritis without adjacent osteomyelitis on imaging were excluded.

Results: 34 patients in the pre-treatment group and 26 patients in the post-treatment group. Overall, 26.7% of blood cultures (rate of positive blood cultures, 23.1% (pre-treatment) versus 29.4% (post-treatment); p = 0.58) and 63.3% of "other" cultures (rate of positive "other" cultures, 73.1% (pre-treatment) versus 55.9% (post-treatment); p = 0.17) were positive. Compared with children who did not receive antibiotics prior to culture, there were no significant differences in odds of a positive culture in children whose cultures were pre-treated with antibiotics for any of the culture types.

Conclusion: Appropriate antimicrobial therapy is essential for good clinical outcome and minimization of long-term complications. Wound, abscess, soft tissue, bone or joint fluid samples cultures have a higher diagnostic yield compared to blood cultures. Pre-treatment of patients with antibiotics prior to culture was not associated with a significant change in culture yield. In children with AHO, antibiotic administration before surgery does not decrease surgical culture yield. Our results suggest that children presenting with suspected AHO should receive appropriate systemic antibiotics promptly after blood cultures are obtained.

(1257) RELIABILITY AND CLINICAL UTILITY OF PAEDIATRIC ANKLE FRACTURE CLASSIFICATIONS: A SYSTEMATIC REVIEW

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Background: Paediatric ankle fractures are common and the associated complications are concerning. Evidence on the role of classification system is limited.

Objective: This study aims to assess the classifications used for paediatric ankle fracture in terms of reliability and clinical utility.

Methodology: A systematic search was performed on PubMed, Embase and Cochrane Library from inception until 1st June 2024. The inclusion criteria were studies which evaluated the reliability and clinical utility of different paediatric ankle fracture classification systems. Exclusion criteria were adult fractures, paediatric non-ankle fractures and lack of classification usage.

Results: There were 41 studies covering 11 classification systems including Salter-Harris, AO, Dias-Tachdjian, Lauge-Hansen, Gerner-Smidt, Ashhurst-Bromer, Carothers-Crenshaw, transitional fractures, atypical triplane fractures, Li-La, and Nenopoulos included in this systematic review. In terms of inter-observer reliability, both the AO classification and the Dias-Tachdjian demonstrated substantial to almost perfect agreement for paediatric ankle fractures, followed by the Salter-Harris classification which showed substantial agreement. The Rapariz classification for transitional fractures showed poor to moderate agreement when using X-ray alone, and the newly proposed Li-La classification showed fair agreement. Anatomical classification like the Salter-Harris classification is better at predicting the rate of premature physeal closure. Mechanistic classification such as the Dias-Tachdjian classification is preferred in predicting the rate of angular deformity.

Conclusion: A combination of anatomical and mechanistic classification systems with adequate training and radiographic assistance should be recommended to improve the clinical outcome of paediatric ankle fractures.

(1288) UNIPOLAR STERNOCLEIDOMASTOID RELEASE COMPLIMENTED WITH OVERCORRECTION NECK BRACING AND PHYSIOTHERAPY FOR A CASE OF NEGLECTED CONGENITAL MUSCULAR TORTICOLLIS.

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Background: Congenital muscular torticollis (CMT) is the third-most common musculoskeletal deformity in the paediatric population. Typical CMT presentations in children are ipsilateral flexion and contralateral rotation of the neck. This is due to sternocleidomastoid (SCM) injury leading to cord-like fibrosis, shortening, and tightness.

Patients with residual or neglected CMT could benefit from surgical release of SCM either via unipolar release at its distal attachment, bipolar release at both the origin and attachment sites, or with additional Z-lengthening of the SCM.

Report: We report a case of an adolescent girl who presented to our centre with a neglected right CMT. She initially presented at age 7, however, parents were not keen for surgery then. Now at age 14, the patient underwent unipolar SCM release distally at the sternal and clavicular heads. Postoperatively, a custom-made thermoplastic neck brace was applied with the head and neck placed in overcorrection position, followed by intensive physiotherapy. At 3-month follow-up, the patient's head and neck position were more centred, and able to maintain a neutral position. Although her craniofacial asymmetry remained, the range of motion for the neck greatly improved.

Discussion: Treatment of neglected CMT is associated with a less favourable outcome. Several studies reported surgical methods which proved to be beneficial even after skeletal maturity. Protocol of physiotherapy and bracing have been introduced to maintain the correction and avoid recurrence.

Conclusions: Unipolar SCM release for neglected CMT, accompanied by neck bracing in an overcorrected position and physiotherapy, provides several benefits, such as a better appearance and improved neck movement and function.

Keywords: Congenital muscular torticollis, neglected congenital muscular torticollis, unipolar sternocleidomastoid muscle release

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(1342) A TALE OF HYPEREXTENDED KNEE: Z PLASTY VS TRADITIONAL V Y PLASTY

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Introduction: We present a case of child born with congenital knee dislocation

Case Report: Child was born with bilateral hyperextended knee with a strong family history of limb deformity on paternal side. X ray of bilateral knee showed congenital knee dislocation. Weekly gradual correction of knee using cylinder backslab, which was done until he was 4 months old. We were able to achieve 90° fexion of right knee and 100° flexion of left knee.

Child started to walk at age of 1 year 5 months old but at age of 1 year 8 months old, right knee flexion limited at 15° with right quadriceps contracture. Serial X ray of the right knee showed subluxation of right knee joint.

Right quadriceplasty + casting was done at age of 2 years 8 months. Intra operative findings were right knee joint dislocation with 10° flexion. Quadriceps tendon was very tight and fibrosis with its surrounding structure. Z-quadriceplasty able to achieved 30° knee flexion. Post knee capsulotomy with soft tissue release, knee flexion was improved up to 80°. Child was put on right cylinder fiberglass cast for 3 weeks. After 5 weeks post op,child was able to ambulate well.

Discussion: Congenital hyperextension of the knee incidence is less than 1 per 1000 birth. It's always associated with significant quadriceps fibrosis and shorthening. A true lateral radiograph of the knee may help to differentiate between knee hyperextension, subluxation and dislocation. Ipsilateral hip dislocation and clubfoot are present 70% and 50% respectively. Unilateral CKD may be associated with neuromuscular dislocation.

Manipulative treatment should in infancy. Surgical treatment for knees that fail to respond to serial manipulation may be done as early as 6 months of age. V-Y quadriceplasty combined with medial and lateral arthrotomies of the knee is the traditional approach. Simple Z-plasty will give adequate tendon length with good functional lengthening.

Conclusion: Z-quadriceplasty can be an option of quadriceps lengthening in operative technique for CKD.

(765) SCOLIOSIS IN CHILDREN AND ADOLESCENTS WITH IDIOPATHIC SHORT STATURE WHO TREATED WITH HUMAN RECOMBINANT GROWTH HORMONE

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Background: Recombinant human growth hormone replacement therapy is associated with several adverse effects in children including prepubertal gynecomastia and malignancy. Regarding musculoskeletal system effects, slipped capital femoral epiphysis in children receiving recombinant human recombinant growth hormone is reportedly more frequent than in the general population. Scoliosis is also a major concern. Whether or not GH therapy can actually cause the progression of scoliosis is debatable.

Objective: The purpose of this study was to evaluate the prevalence of scoliosis in patients with idiopathic short stature who treated with recombinant human recombinant growth hormone. We also aimed to investigate the effect of growth hormone therapy on scoliosis progression.

Methodology: We evaluated 29 patients with scoliosis who were treated with human recombinant growth hormone for idiopathic short stature at our institution. Patient demographics such as age, sex, date of presentation, and the duration of treatment were collected from the medical records. Posterior-anterior radiograph of the spine were reviewed to measure the cobb angle.

Results: The mean age at presentation was 11.8 years (range, 8 to 16). There were 12 boys and 17 girls. The mean cobb angle of the 29 patients at the presentation was 7.8 degrees and the cobb angle at the last follow up was 8.4 degrees.

Conclusion: There is insufficient evidence from this study to conclude that growth hormone treatment can cause scoliosis.

(1156) LANGENSKIOLD PROCEDURE FOR SEQUALAE OF RIGHT KNEE SEPTIC ARTHRITIS – A CASE REPORT.

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Physeal arrest is a common sequalae of septic arthritis particularly in children. It usually occurs when the infection causes damage to the physeal plate leading to the formation of a bony bar that tethers the growth plate and prevent normal growth. The treatment for physeal bar typically requires surgery to restore normal growth and prevent further deformities. Langenskiold procedure was first introduced in 1967, known as physeal bar resection, is.a technically demanding surgery used to treat partial physeal bars occupying less than 50% of physis in children. However, the most significant problem encountered during resection of physeal bar is difficulty in visualizing the bar and the surrounding healthy physis. In our case report, we would like to present the first-time experience in our hospital performing physeal bar resection via arthroscopic assisted technique with bone wax as interpositional material. A 10-year-old girl presented with procurvatum of right leg secondary to physeal arrest of proximal tibia following septic arthritis 5 years ago which was treated with surgical washout and completion of antibiotics. Upon latest examination, patient had a short limb gait. There was right genu valgus and procurvatum deformity over proximal right tibia without any obvious swelling or sinus except healed surgical scars. She also had limb length discrepancy of 1.5cm. Plain radiographs of right knee showed presence of focal bone density bridging across the normally lucent proximal tibia physis. Magnetic Resonance Imaging (MRI) showed 25% physeal bar at center to posteromedial of proximal tibia bridging the epiphysis and metaphysis. In view of size of physeal bar and remaining growth potential, we performed arthroscopic assisted Langenskiold procedure with bone wax as interposition material. Post-operative, above knee cast was applied for 6 weeks. It is important to recognise the sign and symptoms of physeal arrest and start treatment early to prevent devastating long term complications.

(1381) CHALLENGES IN MANAGING PAEDIATRIC NON UNION MEDIAL MALLEOLUS FRACTURE LEADING TO OVERGROWTH OF DISTAL FIBULA AND PROGRESSIVE VARUS DEFORMITY OF ANKLE

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Background: Patient S, a 6-year-old child, presented in February 2016 with progressive varus deformity of the ankle and inability to bear weight following an open ankle fracture sustained five months earlier. Examination revealed varus deformity and a healed scar over the ankle. Radiographs showed varus deformity, lateral malleolar overgrowth, and obliquity of the distal tibial growth plate due to growth imbalance. A CT scan confirmed physeal bar formation at the medial distal tibial growth plate.

Case Report: The patient initially underwent a supramalleolar osteotomy, epiphysiolysis of the medial tibial growth plate with defect filling using bone wax, and fixation of a medial malleolus non-union. Despite this, recurrent varus deformity was noted one year later. Guided growth of the lateral malleolus and removal of the medial malleolus K-wire were performed, though no union of the unossified medial malleolus was seen radiographically. Recurrent deformity persisted due to distal fibular overgrowth despite three additional surgeries from October 2017 to September 2018.At age 9, an X-ray revealed a non-union of the ossified medial malleolus with varus instability. Definitive surgery using bone

grafting and tension band wiring with K-wires achieved union of the medial malleolus, resolving the varus deformity without recurrence.

Discussion: This case highlights the challenges of managing a complex distal tibial varus deformity. The initial difficulty in differentiating between medial physeal arrest and medial malleolus non-union delayed definitive treatment. The non-union contributed to varus deformity by exerting traction on the lateral malleolus growth plate, leading to overgrowth. The precarious skin condition overlying the fracture site rendered simple K-wire fixation ineffective, further complicating management. Delayed diagnosis of the non-union allowed the deformity to progress, necessitating multiple interventions.

Conclusion: Definitive treatment using bone grafting and tension band wiring successfully achieved union of the medial malleolus. Preservation of blood supply facilitated growth and ossification, resolving the varus deformity without recurrence. This case underscores the importance of early diagnosis and precise surgical techniques in addressing complex deformities.

(1157) TAYLOR SPATIAL FRAME APPLICATION FOR RECURRENT KNEE DISLOCATION IN A PATIENT WITH ARTHROGRYPOSIS– A CASE REPORT.

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Arthrogryposis is a single unrelated non progressive disease with common phenotypic characteristic of 3 or more rigid joint contractures in different parts of the body. Congenital dislocation of the knee (CDK) is a rare abnormality which represents a spectrum of hyperextension of knee to anterior tibia dislocation. Treatment of CKD generally involves a combination of conservative and surgical approaches depending on age of presentation and soft tissue condition. A 17-year-old girl with underlying arthrogyprosis presented with shortening of left lower limb secondary to recurrent dislocation of left knee for the past 4 year. Patient underwent multiple surgeries during her childhood. Left hip varus derotational osteotomy and Taylor Spatial Frame (TSF) application of right knee were done and successful. Left knee TSF application with medial capsular release was done at age of 6, subsequently dislocation recurred after removal of cast. Patient underwent TSF application of left knee again at age of 12 which failed again. Patient keen to seek treatment to reduce the left knee and further achieve more limb length. Upon examination, patient had short limb gait with medial thrust of left knee. There was recurvatum deformity over left knee with limited range of motion of -15 to 30 degrees with collateral ligaments laxity. Plain radiographs of left knee showed anterior dislocation of left knee with preserved articular surface. Patient underwent TSF application of left knee as first stage, then planned for diagnostic arthroscopy with ligament reconstruction later. Patient was monitored every 2 weeks with serial radiographs to ensure regime was followed accordingly. After correction total of 2 months, left knee was well reduced. TSF rings were remained while all struts were replaced with hinge to enable patient to initiate gradual range of motion exercises. CDK should be evaluated early to decide on early proper treatment. Non-surgical options are effective in milder cases, whereas in severe, failed conservative or recalcitrant deformity, surgery should be considered.

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(965) RISE OF THE NONTUBERCULOUS MYCOBACTERIA INFECTIONS: OSTEOMYELITIS IN A PEDIATRIC PATIENT

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Background: Non-tuberculous mycobacteria (NTM) infections are becoming more common, particularly in developing nations, with reported rates of 0.3 to 0.87 cases per 100,000 children. NTM can cause various clinical syndromes, including lymphadenitis, skin infections, and osteomyelitis. These bacteria are found in environmental sources such as water, soil, and unpasteurized dairy. Common presentations of NTM infections include cellulitis with draining sinuses or recurring skin lesions. Diagnosis typically requires a detailed medical history, physical examination, and tissue analysis, while treatment generally involves antibiotics and may necessitate surgical intervention for more severe cases.

Report: This case outlines a 3-year-old male who experienced recurrent infections following the Bacillus Calmette Guérin (BCG) vaccine. Initially, he developed an abscess in the right axillary region, which was treated but yielded negative culture results. As time progressed, additional abscesses appeared in the scalp, forehead, and right eyelid, managed with oral antibiotics. Over a year later, the patient was admitted with persistent fever and elevated white blood cell counts, prompting evaluations for conditions such as Langerhans Cell Histiocytosis (LCH) and Pulmonary Tuberculosis (PTB). A bone biopsy suggested chronic osteomyelitis but was negative for tumors. After further treatment failures, a diagnosis of Mycobacterium avium complex (MAC) was confirmed, leading to new treatment adjustments that ultimately showed clinical improvement.

Conclusions: NTM osteomyelitis is rare in immunocompetent individuals, commonly arising from environmental or nosocomial exposures. Key risk factors contributing to NTM infections include traumatic injuries and the use of systemic glucocorticoids. Given the rising incidence of NTM infections, healthcare providers must maintain high suspicion levels for timely diagnosis and treatment. Public health considerations are essential, especially in areas lacking clean water and healthcare access. Developing referral systems for specialized care can enhance case management, ultimately improving patient outcomes.

(1108) OUTCOME AT SKELETAL MATURITY OF FEMORAL VARUS OSTEOTOMY ON LATE ONSET PERTHES DISEASE

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Background: Late onset Perthe disease, which is diagnosed in children older than 8 year old, are considered to have poorer outcome. The outcome depends on the severity of disease, age of presentation and method of treatment. We used Femoral Varus Osteotomy (FVO) as the only surgical procedure and follow all patients until skeletal maturity.

Objective: Outcome of femoral varus osteotomy on late onset Perthes disease at skeletal maturity

Methodology: We reviewed seven patients for Perthes disease from age 9 years old and older from 2000-2023 in our hospital. The severity of the disease were documented based on Herring lateral pillar classification. The final follows up radiographs were assessed base on modified Stulberg classification at skeletal maturity.

Results: We have 7 patients, age 9 to 11 year old with Herring B and C, all of which underwent Femoral Varus Osteotomy procedure performed by the same senior surgeon. Last followed up on skeletal maturity resulted in either Stulberg A or B.

Conclusion: Femoral Varus Osteotomy produces a reasonable outcome in patients of 9 year and older including those with pseudo-hinge abduction.

(1158) SURGICAL MANAGEMENT OF UNICAMERAL BONE CYST IN THE PROXIMAL HUMERUS AND FEMUR OF CHILDREN: A CASE REPORT

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Background: Unicameral bone cysts are benign, fluid-filled cavities located in the metaphysis of long bones, predominantly in the proximal humerus and femur of children. Treatment combinations vary widely, requiring individualized planning based on symptoms, pathological fractures, deformity, and recurrence. We present two cases of unicameral bone cysts in the humerus and femur, emphasizing their management and outcomes.

Report: Case A is a 16-year-old girl presenting with pain and deformity over right arm. She was diagnosed with a unicameral bone cyst in the right proximal humerus at age 10 following a pathological fracture, treated conservatively. Over four years, she sustained two more refractures, resulting in a varus deformity of her right proximal humerus. Imaging revealed centrally located, well-defined radiolucent lesion with thin sclerotic margin extending to midshaft, bone expansion, and cortical thinning without fracture. The case was managed surgically with bone curettage, synthetic bone graft insertion, osteotomy, and PHILOS plate fixation. At three months postoperatively, cavity resolved with graft integration, and she regained full range of movement.

Case B is an 8-year-old boy who is presented with pain and deformity of the right hip after a fall at home. Radiographs showed a comminuted fracture of the right proximal femur with a centric expansile lesion, thinning of lateral cortex, and a 'fallen leaf sign.' MRI findings were consistent with a unicameral bone cyst of the right proximal femur. He underwent bone curettage, synthetic bone graft insertion, and pediatric hip plate fixation. At three months postoperatively, the

fracture showed progressive union, the cyst cavity resolved, and he was fully weight-bearing and pain-free.

Conclusion: These cases emphasize the challenges in managing unicameral bone cysts in weight-bearing and functionally significant bones. Tailored treatment combinations such as bone curettage, bone graft insertion, and appropriate stabilization provide effective outcomes to achieve fracture union, cyst resolution, recurrence reduction, and early rehabilitation.

(966) ACHILLES TENDON CONTRACTURE CAUSED BY CALF TUMORS: ANALYSIS OF RISK FACTORS FOR MISDIAGNOSIS IN CHILDREN

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Background: Calf tumors accompanied by concurrent achilles tendon contracture are relatively rare. Children initially misdiagnosed with calf tumors, who underwent only achilles tendon lengthening, subsequently required secondary surgery.

Objective: This study aims to explore the causes of misdiagnosis and missed diagnosis in children with calf tumors combined with achilles tendon contracture, and to establish a standardized diagnostic process for children's achilles tendon contracture.

Methodology: From March 2011 to April 2020, 20 children with calf tumors and concurrent achilles tendon contracture were admitted to our hospital. Among them, 7 children in Group A were diagnosed with simple achilles tendon contracture, while 13 children in Group B were diagnosed with calf tumors combined with achilles tendon contracture. Retrospective data collection included clinical baseline data, main complaints, imaging tumor site, size, and pathology reports. Statistical analysis was performed to compare the characteristics of the two groups.

Results: The two groups of patients showed no significant difference in gender ratio; however, Group A was younger than Group B (4.67±3.28 years vs. 6.95±3.61 years), although this age difference was not statistically significant. Additionally, the maximum transverse area of the mass in Group A was smaller than that in Group B (2.72±1.80 vs. 9.96±8.85, P<0.05). All patients in Group A reported toe-walking, whereas in Group B, only 2 cases exhibited pure toe-walking, while the others experienced varying degrees of pain and masses.

Conclusion: Achilles tendon contracture may be an early manifestation of calf tumors. Imaging examination and multidisciplinary diagnosis and treatment can effectively reduce missed diagnosis and misdiagnosis.

(1396) RARE PEDIATRIC PROXIMAL FIBULA OSTEOSARCOMA: NAVIGATING ONCOLOGIC SUCCESS AND SURGICAL COMPLEXITY

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Background: Osteosarcoma is an aggressive malignant bone tumor predominantly affecting adolescents. It typically originates in the distal femur, proximal tibia, or proximal humerus. Here, we highlight a rare case of proximal fibula osteosarcoma in a pediatric patient who showed excellent tumor necrosis after neoadjuvant chemotherapy, potentially improving overall survival outcomes.

Report: A 4-year-old boy presented with a one-month history of left calf swelling and pain, though he remained able to ambulate and bear weight. He had no history of trauma, infection, or other systemic symptoms. Clinical examination revealed a firm, non-mobile swelling over the head of the left fibula with minimal tenderness, but the overlying skin appeared normal. Plain radiograph of the left tibia and fibula showed a characteristic sunburst appearance at the metaphyseal junction of the proximal fibula. MRI of the left knee further demonstrated a heterogeneously enhancing intramedullary mass originating from the epiphysis of the proximal fibula, extending into the metaphysis, and encasing the left tibioperoneal trunk. Given the strong suspicion of primary osteosarcoma, a trucut biopsy of the left fibula was performed alongside chemoport insertion. Histopathological examination confirmed the diagnosis of osteosarcoma. The patient was initiated on neoadjuvant chemotherapy, followed by a wide resection of the left fibular head and neurotization of the common peroneal nerve to the anterior tibialis muscle as preservation of the common peroneal nerve was not feasible. A combined medial and lateral approach to the proximal leg was utilized. Intraoperative histopathological assessment revealed residual conventional osteosarcoma with post-chemotherapy changes, demonstrating 100% tumor necrosis and clear surgical margins. Postoperatively, as anticipated, the patient developed a left foot drop. He resumed adjuvant chemotherapy while continuing rehabilitation.

Conclusion: In conclusion, achieving a high rate of tumor necrosis following neoadjuvant chemotherapy protocol significantly improves the survival outcomes in osteosarcoma patients, particularly when followed by wide surgical resection with clear margins. However, proximal fibula osteosarcoma is rare and presents unique surgical challenges due to its close proximity to the common peroneal nerve, often complicating nerve preservation and functional outcomes.

(1370) LATERALIZATION OF THE FEMORAL HEAD AFTER THE GRADUAL TRACTION FOR DEVELOPMENTAL DYSPLASIA OF THE HIP

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Introduction and Objective: Overhead traction (OHT) is one of the conservative treatment for intractable developmental dysplasia of the hip (DDH). It requires gradual traction, but with appropriate methods, it could complete the treatment without complication such as avascular necrosis (AVN). After required the reduction, some of the cases become femoral head lateralization. The purpose of this study is to check the outcome of the OHT, and the finding the cause of the lateralization of the femoral head.

Method: We retrospectively reviewed 13cases 15hips with DDH treated with OHT. 9 cases were difficult to reduction with pelvic harness, and 4 cases were diagnosed as dislocation after walking start. The age at the reduction ranged from 7M to 28M. We assessed the dislocation reduction rate and the AVN rate and the rate of lateralization of the femoral head.

Results: 13 joints (86.6%) were successfully reduced, 2 joints required surgery. 1 joint underwent open reduction, and 1 joint underwent arthroscopic surgery to remove thickening of the pulvinar. There were no cases of AVN. After the reduction with OHT, 3 joints didn't re-dislocate but developed lateralization. 2 joints were treated with Salter innominate osteotomy, 1 joint will be considered for surgery in the future. These 3 cases of the lateralization of the femoral head were acetabular angles of 35 degrees or more.

Conclusions: OHT could reduce intractable dislocation and was a good method to reduce AVN under proper management but the acetabular angles of 35 degrees or more become the femoral head lateralization.

(873) MULTIPLE OUTCOME FOLLOWING OSTEOGENESIS IMPERFECTA IN PEDIATRIC TREATED WITH VARIOUS FIXATION IN DEVELOPING COUNTRY

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Background: Osteogenesis imperfecta (OI) is a rare genetic disorder that occurs in 1 in 15,000 to 20,000 live births. OI is a genetically heterogeneous skeletal disorder characterized by bone fragility, growth deficiency, and deformities, caused by defects in type I collagen synthesis or processing. Clinical manifestations of OI range from mild forms with almost no symptoms to severe cases involving newborns leading to increased perinatal mortality. Understanding this disease is crucial for early diagnosis, effective management, and improving patient outcomes.

Report: We report a case of a 13-year-old boy with pain in the right thigh, who was planned for implant removal and internal fixation reconstruction surgery. The pain was followed by a deformity in the right thigh after undergoing standing therapy in the rehabilitation department. On physical examination, The right lower extremity and left humerus regions both displayed post operative scars, with no signs of fistula, and unclear deformity. On palpation, tenderness was present in both areas, with no neurovascular deficits. Range of motion in the hip, knee, shoulder, and elbow joints was limited due to pain and weakness. Additionally, the patient exhibited signs of dentinogenesis imperfecta and blue sclera. A bone survey without contrast was performed, revealing multiple internal fixations in the right femur with bowing, callus formation, and adequate alignment. Intramedullary pinning was noted in the left femur and proximal right tibia, both showing good alignment and callus formation. The patient was

diagnosed with OI Silence type I and multiple fractures.

Conclusion: Our experience demonstrated that the clinical manifestations of OI vary from mild forms to severe cases. In this particular case, the patient with OI experienced multiple fractures, each of which was treated with a different fixation. Therefore, multiple fracture management should be individualized, considering the condition's severity and the specific clinical requirements of the patient.