ISSN: 2755-6468

Review Article

Open Access Journal of Clinical Pathology Research

Coxa Profunda- A Neglected Entity in Children with HIP Pathology?

Lorena Nincă[1*], Andreea Nincă[1], Amalia Teodora Vancea[2,3], Daniela Profir[1], Iulia Maria Belc[1], Doinița Oprea[1,2], Mădălina Gabriela Iliescu[1,2]

[1]Techirghiol Balneal & Rehabilitation Sanatorium, Constanța, Romania
[2]Ovidius University Constanța, Romania
[3]Clinical Emergency Hospital of Constanța "Sf. Apostol Andrei", Romania

[*]Corresponding author
Lorena Nincă, Techirghiol Balneal & Rehabilitation Sanatorium, Constanța, Romania.

Received: September 16, 2025; **Accepted:** September 25, 2025; **Published:** October 01, 2025

ABSTRACT

Coxa profunda is a less commonly recognized anatomical variation of the hip joint, defined radiographically by medial extension of the acetabular fossa beyond the ilioischial line. Traditionally regarded as a marker of acetabular overcoverage and pincer-type femoroacetabular impingement (FAI), its interpretation has been challenged in recent years, with increasing evidence suggesting alternative morphological and biomechanical implications.

We present the case of an 11-year-old girl with a history of hip trauma, subsequently diagnosed with slipped capital femoral epiphysis (SCFE) and radiographic coxa profunda. The patient underwent surgical treatment and later two structured rehabilitation programs. Clinical and functional assessments revealed gradual improvements in joint mobility, muscle balance, and gait stability, despite persistent deficits.

This case underscores the importance of recognizing coxa profunda as a potential contributor to hip dysfunction in pediatric patients, particularly in post-traumatic contexts, and highlights the role of individualized rehabilitation in optimizing functional outcomes.

Keywords: Coxa profunda, Pediatric Hip Pathology, Slipped Capital Femoral Epiphysis, Rehabilitation

Introduction

Coxa profunda is defined radiographically by medial extension of the acetabular fossa beyond the ilioischial line on standard anteroposterior pelvic X-rays. As noted by it is more prevalent in females [1,2]. Historically, it has been interpreted as a radiographic marker of acetabular overcoverage, particularly in the context of pincer-type femoroacetabular impingement (FAI). However, its diagnostic value has been reconsidered in recent years. found no association between coxa profunda and other radiological signs of FAI, suggesting that it should not be used as a surrogate indicator of pincer-type impingement [2].

In a Japanese cohort, reported that anterior and posterior acetabular sector angles were consistently greater in female patients with coxa profunda [1]. In contrast, male patients with this finding demonstrated increased lateral center-edge angles, greater anterior acetabular sector angles, and reduced acetabular roof obliquity angles. Observed that radiographic coxa profunda in patients with hip dysplasia does not indicate increased acetabular coverage or depth, but rather reflects a pattern of acetabular dysplasia characterized by anteversion, anterolateral deficiency, and inward pelvic rotation [3]. Further emphasized that in many female patients, coxa profunda correlates not with acetabular overcoverage, but with anterior acetabular dysplasia and increased anteversion, thereby challenging its conventional diagnostic meaning [4].

Citation: Lorena Ninca, Andreea Ninca, Amalia Teodora Vancea, Daniela Profir, Iulia Maria Belc, et al. Coxa Profunda- A Neglected Entity in Children with HIP Pathology? Open Access J Clin Path Res. 2025. 1(2): 1-3. DOI: doi.org/10.61440/OAJCPR.2025.v1.14

Expanded this perspective by noting that in adolescents, particularly females, coxa profunda may be associated with variable femoral version and acetabular orientation, factors that predispose to mechanical conflict and abnormal joint loading [5]. Similarly, highlighted that deep acetabular sockets in skeletally immature hips can contribute to subtle instability or paradoxical impingement, particularly in the presence of obesity or after minor trauma [6,7].

In pediatric populations, coxa profunda may therefore represent an underrecognized contributor to hip dysfunction, especially in the context of traumatic injury where structural anomalies can be overlooked. This is especially relevant in cases complicated by slipped capital femoral epiphysis (SCFE), a condition strongly linked to mechanical stress at the growth plate and often exacerbated by pre-existing acetabular dysplasia or morphological variants. Early recognition of such structural abnormalities through imaging and functional evaluation is essential for accurate diagnosis, timely intervention, and tailored rehabilitation.

Methodology In September 2024, an 11-year-old adolescent girl was admitted for the first time to the Pediatric Neuropsychomotor Rehabilitation Department at Techirghiol Balneal and Rehabilitation Sanatorium for clinical-functional evaluation and implementation of a rehabilitation program tailored to her impairments.

Her medical history revealed that in November 2023 she sustained a fall on ice. Over the following two months, she reported persistent pain on the lateral aspect of the left hip radiating to the knee. In January 2024, she became unable to lift her leg from the bed surface, prompting emergency evaluation. Imaging confirmed left femoral head epiphysiolysis, and surgical treatment was performed. The osteosynthesis hardware was removed in August 2024. Until referral, the patient had not undergone physical therapy.

On clinical examination in September 2024, the patient was overweight (BMI 27.6 kg/m²) but otherwise hemodynamically and respiratory stable. Spinal examination showed forward flexion with fingertips reaching mid-calf, full extension, and preserved lateral inclinations, with accentuation of secondary right-convex lumbar scoliosis due to a 2.5 cm right lower limb shortening. In supine position, the right lower limb was externally rotated. Postoperative scars on the lateral aspect of the left hip appeared violet, supple, and non-adherent. Muscular examination revealed right gluteal hypotrophy and gluteus medius strength of –4/5 MRC bilaterally. Hip mobility testing demonstrated passive flexion of 90° with slight external rotation, external rotation of 30°, and internal rotation of 5° on the right side, and passive flexion of 80° with external rotation and absent internal rotation on the left side. Palpation provoked tenderness over the medial knee joint line. Gait analysis revealed limping due to the limb length discrepancy. Functional Independence Measure (FIM) was scored at 35 points, indicating moderate disability (yellow zone).

Pelvic radiograph obtained during hospitalization showed right-sided coxa profunda.

The patient underwent a multidisciplinary rehabilitation program consisting of saltwater baths with Techirghiol lake water, mud wraps with sapropelic mud, bubble baths, ultrasound therapy, interferential currents, deep oscillation therapy, and physical therapy for muscle strengthening and mobility.

In December 2024, the patient was readmitted for re-evaluation and continuation of therapy. Her history was consistent with the initial admission: a fall in November 2023, subsequent hip pain, inability to lift the leg in January 2024, surgical treatment, and removal of osteosynthesis material in August 2024. She had started physical therapy in September 2024.

On examination, she remained overweight but stable. Spinal evaluation confirmed forward bending to mid-calf and accentuated right-convex lumbar scoliosis due to the 2.5 cm discrepancy. In supine position, the right leg was externally rotated, while the left leg was internally rotated. Postoperative scars on the left hip remained supple and non-adherent. Muscle testing showed persistent right gluteal hypotrophy and gluteus medius strength of –4/5 bilaterally. Hip mobility had improved, with passive flexion of 95° with slight external rotation, external rotation of 30°, and internal rotation of 20° on the right side, and passive flexion of 95° with external rotation and internal rotation of 20° on the left side. A Trendelenburg-type limping gait persisted. Functional Independence Measure (FIM) remained 35 points, indicating moderate disability (yellow zone).

The rehabilitation program prescribed during this admission included saltwater baths, mud therapy, bubble baths, interferential currents, Russian stimulation, deep oscillation therapy, Balance Tutor training, R-force anti-gravity treadmill at 80% load, and targeted physical therapy for strengthening, mobility, proprioception, and gait retraining.

[Pictures from personal archive]

Results

The patient showed favorable clinical progress across the two rehabilitation admissions. After the September 2024 intervention, modest improvements were documented in left hip mobility, with flexion increasing from 80° to 90° and internal rotation from 0° to 5°. By December 2024, further gains were achieved, with flexion improving to 95° and internal rotation to 20°.

Gluteus medius strength remained –4/5 bilaterally but was preserved across both evaluations, suggesting prevention

of further atrophy. Gait evaluation revealed a persistent Trendelenburg limp caused by the 2.5 cm limb length discrepancy, but pelvic stability and trunk control improved during ambulation, suggesting neuromuscular adaptation.

The patient tolerated the comprehensive rehabilitation program well, including hydro-thermotherapy, electrotherapy, proprioceptive training, and gait retraining with advanced technologies such as Balance Tutor and the R-Force treadmill. The FIM score remained stable at 35 (moderate disability), although qualitative assessments indicated enhanced coordination, balance, and pain reduction during functional mobility.

Overall, the therapeutic approach facilitated measurable improvements in joint mobility, maintenance of muscle function, and partial alleviation of gait impairment, reinforcing the importance of early and targeted rehabilitation in pediatric patients with hip pathology and associated anatomical variants such as coxa profunda.

Conclusion

This case highlights the clinical significance of coxa profunda as a frequently overlooked anatomical variant. As demonstrated by coxa profunda does not always imply acetabular overcoverage but may reflect underlying dysplasia or altered anteversion patterns with important biomechanical consequences [4,5]. In our pediatric patient, failure to recognize this morphology at presentation could have delayed diagnosis and contributed to complications, particularly in the context of SCFE, where acetabular shape may exacerbate physeal stress, consistent with the observations of [8,6].

Our case underscores the necessity of early diagnosis through targeted imaging and detailed morpho-functional evaluation. The implementation of a complex rehabilitation program—including hydrotherapy, electrotherapy, proprioceptive stimulation, and gait retraining—produced measurable functional gains in hip mobility, muscular stability, and gait performance, despite the persistence of moderate disability as reflected by the unchanged FIM score. This also highlights the limitation of conventional outcome scales in capturing meaningful progress in pediatric patients with complex anatomical hip variants.

Given the limited literature on coxa profunda in children and adolescents, particularly regarding its functional impact and response to conservative treatment, this case contributes to the growing understanding of its biomechanical significance and rehabilitative potential. As emphasized by re-evaluation of this anatomical finding is needed, considering its diverse morphologies and capacity to contribute to both instability and impingement [7]. Future multicentric studies should aim to establish clear diagnostic criteria, stratify clinical risk, and optimize therapeutic strategies, particularly those integrating individualized rehabilitation during critical developmental stages.

Ultimately, raising awareness of coxa profunda as more than a radiographic curiosity may promote earlier and more effective interventions, with potential to improve long-term outcomes in pediatric hip pathology.

References

1. Goto T, Mineta K, Sato K, Hamada D, Sairyo K. Correlation between coxa profunda and morphological parameters in Japanese patients. J Orthop. 2016. 13: 143-147.
2. Diesel CV, Ribeiro TA, Coussirat C, Scheidt RB, Macedo CAS, et al. Coxa profunda in the diagnosis of pincer-type femoroacetabular impingement and its prevalence in asymptomatic subjects. Bone Joint J. 2015. 97: 478 - 483.
3. Fujii M, Nakamura T, Hara T, Nakashima Y, Iwamoto Y. Does radiographic coxa profunda indicate increased acetabular coverage or depth in hip dysplasia? Clin Orthop Relat Res. 2015. 473: 2056-2066.
4. Kato M, Ando T, Mitamura S. Morphological features of the acetabulum with coxa profunda in women: a retrospective observational study. BMC Musculoskelet Disord. 2024. 25: 426.
5. Maranho DA, Davila-Parrilla A, Miller PE, Kim YJ, Novais EN, et al. Acetabular morphology in slipped capital femoral epiphysis: comparison at treatment onset and skeletal maturity. J Child Orthop. 2018. 12: 444 - 453.
6. Sankar WN, Nevitt M, Parvizi J, Felson DT, Agricola R, et al. Femoroacetabular impingement: defining the condition and its role in the pathophysiology of osteoarthritis. J Am Acad Orthop Surg. 2013. 21: S7-S15.
7. Nepple JJ, Lehmann CL, Ross JR, Schoenecker PL, Clohisy JC. Coxa profunda is not a useful radiographic parameter for diagnosing pincer-type femoroacetabular impingement. J Bone Joint Surg Am. 2013. 95: 417- 423.
8. Anderson LA, Kapron AL, Aoki SK, Peters CL. Coxa profunda: is the deep acetabulum overcovered? Clin Orthop Relat Res. 2012. 470: 3375 - 3382.