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| RESEARCH ARTICLE

Bilateral Slipped Capital Femoral Epiphysis in an Obese Patient: A Case Report and Review of Literature

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| ABSTRACT
Slipped capital femoral epiphysis (SCFE), the predominant hip disorder affecting pre-adolescent and adolescent populations, exhibits a significant clinical association with obesity. We present a case of a 10-year-old obese boy who initially presented with unilateral thigh pain following minor trauma, with the initial radiographs misinterpreted as normal and was discharged. Three weeks later, he developed bilateral hip pain and antalgic gait. Subsequent imaging studies confirmed SCFE (Southwick grade I), confirmed by a positive Klein's line and physeal widening. The patient underwent successful bilateral percutaneous in-situ fixation using cannulated screws. Postoperatively, a strict non-weight-bearing (NWB) protocol was implemented for 6–8 weeks, followed by progressive partial weight-bearing (PWB), resulting in normal hip range of motion and resolution of pain by the tenth week. This case highlights the diagnostic challenges associated with early and atypical presentations of SCFE, particularly among obese populations, in whom subtle radiographic findings may be overlooked. Standard management involves in-situ screw fixation to stabilize the physis and prevent further slippage, aiming to minimize long-term complications such as avascular necrosis and femoroacetabular impingement. Prophylactic contralateral hip fixation remains a topic of clinical debate but still considered in high-risk patients. Postoperative weight-bearing protocols remain variable, with a trend toward individualized, staged rehabilitation based on slip severity and stability. This case underscores the importance of early recognition and thorough radiographic assessment, including both anteroposterior and lateral imaging in pediatric patients presenting with hip, thigh, or knee pain, particularly those with risk factors such as obesity. Long-term follow-up is essential to monitor for complications and optimize outcomes. Prompt intervention, combined with individualized postoperative management, is essential for achieving optimal functional recovery and minimizing the risk of progression or recurrence of SCFE.

| KEYWORDS
Slipped Capital Femoral Epiphysis (SCFE), Obesity, Bilateral SCFE, In-situ fixation, Cannulated screws, Paediatric orthopaedics, Klein's line, non-weight-bearing, femoroacetabular impingement, prophylactic fixation

| ARTICLE INFORMATION

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1. Introduction

Slipped capital femoral epiphysis represents the most prevalent hip pathology among adolescents and it occurs due to weakened proximal femoral physis leading to the displacement of the epiphysis in a posterior and medial direction relative to the metaphysis (Mathew & Larson, 2019a). A body mass index (BMI)-for-age percentile ≥95% was observed in 63% of individuals with unilateral SCFE and 91% of those with bilateral SCFE, reinforcing the marked association between obesity and SCFE, especially, in bilateral cases (Aversano et al., 2016).

Accurate diagnosis needs high clinical suspicion and appropriate radiographic assessment. Anteroposterior (AP) and lateral "frog-leg" radiographs are essential, as early physeal widening or Klein's line abnormalities may only be detectable on lateral views (Green et al., 2009).

Bilateral involvement is reported in 20% to 80% of cases, and when it occurs, the contralateral slip typically develops within the first year following the initial event (Novais and Millis, 2012). In unilateral cases, to mitigate the risk of contralateral slippage, some surgeons advocate for prophylactic fixation of the contralateral hip; however, this approach remains controversial, with ongoing debate regarding its indications despite supportive evidence in the literature (Khalifa, 2025).
We present the case of a 10-year-old obese male with bilateral SCFE to highlight the challenges in early diagnosis, surgical decision-making, and postoperative rehabilitation. This case emphasizes the importance of maintaining high clinical suspicion in early presentations and examines the evolving role of bilateral hip fixation in preventing disease progression and long-term complications.

2. Case presentation

A 10-year-old obese boy (body mass index >95th percentile) initially presented to the emergency department (ED) with left thigh pain following a bicycle fall. On examination, mild tenderness was noted over the left quadriceps; however, there was no swelling, deformity, or limitation in the range of motion at the hip or knee. An X-ray of the left hip (Figure 1) was interpreted as normal, and the patient was subsequently discharged with analgesics.

Figure 1

Three weeks later, the patient returned to the ED with bilateral hip pain and antalgic gait that had developed insidiously. There was no history of further trauma. Clinical examination revealed pain on movement of his left hip, although he remained able to bear-weight. Repeated X-ray (Figure 2) demonstrated bilateral abnormalities; positive Klein's line on both sides with evident widening of the physis. These findings were consistent with bilateral SCFE, classified as Southwick grade I.

Figure 2

Thereafter, the patient underwent bilateral percutaneous in-situ fixation under image guidance. Via anterolateral approach, fully threaded 7 mm cannulated screws were placed across the epiphyseal plates on both sides to stabilize the slips (Figure 3). Postoperatively, strict NWB was advised for 6 to 8 weeks along with analgesics.

Figure 3

During the course of recovery, follow up x-rays confirmed satisfactory screw positioning without evidence of displacement. Initially, physiotherapy focused solely on muscle strengthening was commenced. At 8 weeks post-operation, PWB was initiated based on the patient's tolerance. by postoperative week 10, the patient exhibited normal hip range of motion and complete resolution of pain. The patient will continue to be followed up long-term to monitor growth and physeal closure until skeletal maturity.

3. Discussion and review of literature

The most common hip pathology in pre-adolescents and adolescents is Slipped capital femoral epiphysis which is often associated with obesity and characterized by posterior and inferior slippage of the femoral epiphysis (Mathew & Larson, 2019b). Our case of bilateral SCFE in a 10-year-old obese male underscores issues in diagnosis, management, and postoperative care, including the evolving role of weight-bearing restrictions and prophylactic fixation.

One of the challenges is the early diagnosis of SCFE, especially in mild and atypical cases. Evaluation of SCFE relies significantly on radiographic imaging, with anteroposterior (AP) and lateral frog-leg projections. Earliest radiographic features on the AP view typically present as widening and irregularity of the growth plate. However, subtle displacements of the capital femoral physis cannot usually be detected on the AP projection, and more likely to be detected on the lateral frog-leg projection (Green et al., 2005). The education of primary care physicians on the importance of both radiographic views and the early SCFE signs is crucial, as they usually assess the patient first. This can help primary care physicians to make early referrals, which can improve outcomes.

Percutaneous in-situ fixation using a single cannulated screw perpendicular to the physis and centered, with at least five threads engaging the epiphysis to stop progression, is currently the best practice for SCFE (Johns et al., 2023). Using two screws in can improve stability; however, it raises the risk of complications such as accidental joint penetration (Martínez-Álvarez et al., 2012). Postoperative imaging is essential to confirm screws position and monitor for complications such as avascular necrosis (Journal, n.d.).

In Unilateral SCFE, prophylactic fixation of the contralateral asymptomatic hip remains controversial. The aim of prophylactic fixation is to prevent complications of subsequent SCFE such as pain, loss of motion, femoroacetabular impingement, chondrolysis, and avascular necrosis (Lindell et al., 2022). Considering the risk-benefit ratio, it appears that Prophylactic fixation of the contralateral healthy hip in SCFE is a safe procedure with low complication risk (Anghilieri at al., 2022). For this purpose, cannulated screw fixation is considered the safest technique (Anghilieri at al., 2022). However, large-scale, prospective, randomized controlled trials comparing prophylactic fixation to close observation is needed to confirm the current recommendations.

Another controversary is the post-operative protocol. Traditionally, a period of non-weight-bearing was advised for an average of 6 weeks after fixation. In current practice, the majority of surgeons prefer to postpone full weight-bearing for several weeks and recommend protected weight-bearing in stable SCFE (Johari & Pandey, 2016). In contrast, minority of orthopedic surgeons permit full weight-bearing for mild stable SCFE without known complications (Johari & Pandey, 2016). In our case, due to the bilateral nature of the presentation, several weeks of non-weight-bearing were recommended to the patient to be more careful. Clear guidelines for weight-bearing limitations following surgery are not well-established. Postoperative weight-bearing protocols have a direct impact on the patients and their families, in terms of hospital stay duration and timeline for resuming activities such as returning to school. Therefore, Evaluation of the effects of different weight-bearing strategies on clinical outcomes in pediatric patients is needed.

Although the literature poorly defines postoperative rehabilitation for SCFE, a five-phase protocol used after hip arthroscopy is recommended here, which includes reducing inflammation and protecting tissues, progressing to pain-free walking without

crutches, strengthening muscles and improving motion, and finally regaining functional power for daily activities or sports (Spencer-Gardner et al., 2014). The timeline for returning to play is individualized by the surgeon.
long-term follow-up including regular clinical assessments and Radiographs is a crucial part of patient management following SCFE to monitor for complications and optimize results. Consistent assessment of hip range of motion is important, as limitations may indicate early femoroacetabular impingement (Fradet et al., 2024).The FADDIR (Flexion, ADduction, and Internal Rotation) and FABER (Flexion, ABduction, and External Rotation) maneuvers are useful clinical tools to detect hip joint pathology, by inducing pain or restricted motion during examination (Fradet et al., 2024).

4. Conclusion

This case of bilateral slipped capital femoral epiphysis in an obese 10-year-old male underscores the critical need for early detection and timely intervention in managing this hip pathology. A delay in diagnosis may result in bilateral progression and an increased risk of adverse outcomes, highlighting the need of thorough clinical and radiographic evaluation—including both anteroposterior and lateral imaging—to identify initial signs such as physeal widening and abnormal Klein's line. Surgical stabilization with in-situ screw fixation remains the standard of care to prevent further slippage and long-term sequelae. Postoperative management, including weight-bearing limitations and tailored rehabilitation, should be adjusted according to slip severity and stability. Additionally, sustained long-term follow-up is imperative to monitor potential complications and ensure optimal functional recovery.

Conflicts of Interest: The authors declare no conflict of interest.
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