Case Report
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# TOTAL HIP REPLACEMENT IN CHRONIC SLIPPED CAPITAL FEMORAL EPIPHYSIS WITH DEGENERATIVE JOINT DISEASE: A CASE REPORT

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## ABSTRACT

Slipped capital femoral epiphysis (SCFE) is the most common hip disorder affecting the adolescent population, with a reported annual incidence of 8.8 to 10.8 per 100,000 children aged 9 to 16 years. SCFE is known to affect boys more often than girls. Chondrolysis and osteonecrosis of the hip can accelerate hip degeneration related to SCFE, leading to end-stage hip disease. Total Hip Arthroplasty (THA) is the primary treatment option for managing endstage hip Osteoarthritis (OA) in SCFE patients. Case Presentation a 22 years old male presented with a 2,5 years of pain in the left hip joint with a history of trauma three years ago; after that, he could still walk. Four months later, he feels pain in the left hip that gets aggravated on walking and cannot walk for long distances (5-10m). Postoperatively the patient has an equal leg length, with less pain on the hip with a good range of motion, and can walk dependently using a cane. THA to be a feasible treatment option in young patients with secondary osteoarthritis of the hip due to SCFE. Uncemented THA has a good survivorship rate.

Keywords: Slipped capital femoral epiphysis, total hip arthroplasty.



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## INTRODUCTION

Slipped capital femoral epiphysis (SCFE) is the most common hip disorder affecting the adolescent population, with a reported annual incidence of 8.8 to 10.8 per 100,000 children aged 9 to 16 years(1,2). SCFE is known to affect boys more often than girls. However, there are few case reports in the literature describing this condition in an older patient. It is believed that the etiology is multifactorial and may include obesity, trauma, and, less frequently, endocrine pathologies comprising hypothyroidism, hypogonadism, and panhypopituitarism. It is a Salter-Harris type I fracture characterized by slippage through the hypertrophic zone of the upper femoral epiphysis such that the femoral head remains in the acetabulum and the neck is displaced anteriorly and externally rotated (2).

SCFE patients may develop early degenerative joint disease secondary to abnormal joint kinematics or femoral acetabular impingement. In addition, Chondrolysis and osteonecrosis of the hip can accelerate hip degeneration related to SCFE, leading to end-stage hip disease(1). Total Hip Arthroplasty (THA) is the primary treatment option for managing end-stage hip Osteoarthritis (OA) in SCFE patients. However, patients with SCFE represent a minority group among those treated with primary THA[2]. We did a total hip arthroplasty on a 22 years old male with chronic slipped capital femoral epiphysis with early degenerative joint disease.

## PRESENTATION OF CASE

A 22 years old male presented with a 2,5 years of pain in the left hip joint with a history of trauma (felt from the bicycle) 3 years ago; after that, he could still walk. Four months later, he felt pain in the left hip, which aggravated walking, and could not walk for long distances (5-10m), patient walk with limping. There is no history of metabolic disorders. Examination revealed the left lower limb in external rotation, tenderness over the left hip, and 2cm short. Flexion, abduction, and internal rotation are limited compared to opposite normal hips, and movement is painful on the terminal range of motion. Radiographs showed evidence of left severe slipped capital femoral epiphysis and damage/defect at superior of the acetabulum. The blood and urine workup were both normal.


**Figure 1.** Xray Pelvic a 22 years old male with SCFE.

An experienced attending orthopaedic surgeon performed the surgery. Following appropriate positioning on the operating table in the lateral position, standard preparation and draping were performed. The exposure was achieved through a

standard posterior approach. Intraoperative, we found that the epiphysiolysis head already united with the neck femur, and there is a defect at the superior acetabulum also already degenerative/osteoarthritis. So it's decided to perform cementless Total Hip Arthroplasty in this patient.

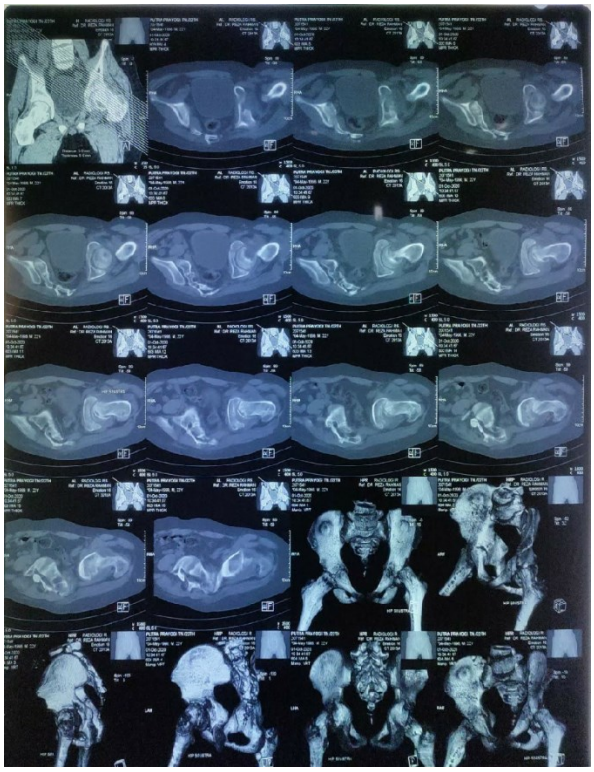

Figure 2. Preoperative CT scans of the hip

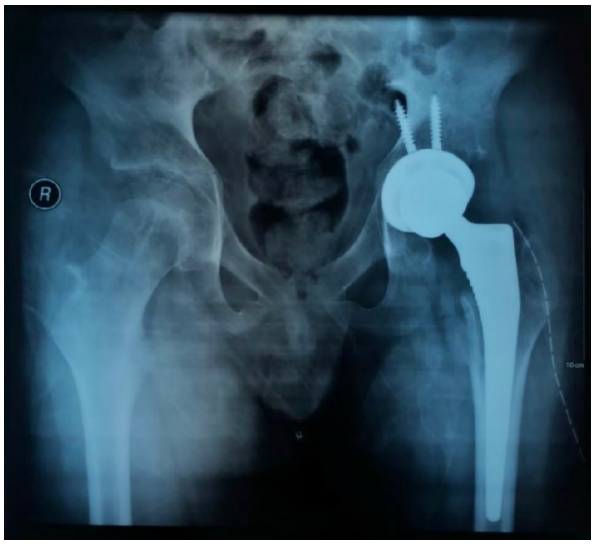

**Figure 3.** Radiograph after operation THA left hip

## DISCUSSION

In SCFE, the epiphysis, or head of the femur slips down and backwards off the neck of the bone at the growth plate. SCFE is the most common hip disorder affecting the adolescent population, with a reported annual incidence of 8.8 to 10.8 per 100,000 children aged 9 to 16 years (1,2). SCFE is known to affect boys more often than girls. The etiology of SCFE is multifactorial and may include obesity, trauma and, less frequently the role of endocrine disruption remains controversial. Sometimes SCFE occurs suddenly after a minor fall or trauma. More often, the condition develops gradually over several weeks or months, with no previous injury.

The most common symptoms of SCFE are limping and pain that is poorly localized to the hip, groin, thigh, or knee. Knee or distal thigh pain is the presenting symptom in 15% of patients with this condition. On physical examination, the patient may have an antalgic gait or cannot bear weight with a severe slip. The leg is externally rotated and is 1–2 cm short. Characteristically there is a limitation of flexion, abduction, and medial rotation. A classic sign is a tendency to increasing external rotation as the hip is flexed (3,4).

Classification of SCFE is based on the stability of the physis (10). If the patient can ambulate with or without crutches, the SCFE is considered stable. If the patient is unable to ambulate even with crutches, it is

considered unstable. Stable SCFE accounts for about 90% of all slips (4). Classification is important because stable SCFE generally has a much better prognosis than unstable SCFE, which has a higher complication rate. Another classification scale uses symptom duration; it defines acute symptoms as those present for less than three weeks, chronic symptoms as those that have been present three weeks or longer, and acute-nonchronic symptoms as those that involve an acute exacerbation of chronic symptoms (4,5).

Radiography is used to grade the severity of the slip in SCFE. On an AP radiograph, a line along the superior margin of the femoral neck (line of Klein) should intersect the lateral corner of the epiphysis. As the epiphysis slips, the metaphysis can be divided into thirds. mild: lateral edge of the epiphysis is within the lateral third of the metaphysis, moderate: middle third, and severe: medial third.

The Wilson method measures the relative displacement of the epiphysis on the metaphysis in a frog-leg lateral radiograph. A mild slip involves epiphysis displacement less than one-third of the metaphysis's width; a moderate slip involves displacement between one-third and one-half of the width; and a severe slip involves displacement greater than one half of the width. The Southwick method measures the epiphyseal shaft angle on the frog-leg lateral radiograph. The angle is calculated by subtracting the epiphyseal shaft angle on the uninvolved side from that on the side with SCFE. A mild slip is less than 30 degrees, a moderate slip is between 30 and 50 degrees, and a severe slip is greater than 50 degrees (4).

Magnetic resonance imaging has been used to detect and stage avascular necrosis (AVN) of the femoral head. Computed tomography Three-dimensional CT scanning has proved useful in the preoperative planning of realignment procedures for complex proximal femoral deformities.

THA is the most common and robust surgical treatment for end-stage hip disease related to SCFE. The decision for joint replacement must be individualized to meet patient needs considering the level of perceived pain and disability like THA for osteoarthritis. The timing for hip replacement for the SCFE patient may occur at a younger age due to earlier onset of symptoms (1).

There are several issues to consider when proposing THA for the sequelae of SCFE. For the young age of patients, the loss of head-neck offset, the distorted proximal femoral anatomy, and the femoroacetabular impingement are crucial anatomic considerations to restore hip kinematics. Although standard THA usually allows recovery of hip biomechanics in SCFE, custom-made prostheses or modular necks may further increase the possibility to restore the proximal femoral anatomy and metaphyseal bone contact or leg length and the appropriate femoral neck anteversion (6).

The results of cemented THA in the young patient have been disappointing. The probability of radiographic loosening after

15 years was 60% for the acetabular component and 20% for the femoral component in a Mayo Clinic series from 1972 through 1980. Symptomatic loosening of the acetabular component was also nearly 3 times more common than that of a femoral component. In addition, Torchia et al. demonstrated a high failure rate of cemented THA in young patients reaching 45% at 15 years postoperatively.

In North America, uncemented THA is the treatment of choice for a young patient with end-stage hip arthritis. There are several uncemented stems with more than 15-to-20-year data demonstrating excellent results. For example, uncemented primary femoral stems from the Norwegian Arthroplasty Register, using the endpoint of revision for aseptic loosening, had survivorship between 96% and 100% at ten years. In our case, we did uncemented THA (7).

Alternative bearing surfaces such as metal on highly cross-linked polyethylene, ceramic on ceramic, and ceramic on highly cross-linked polyethylene should be considered Engesaeter et al. found no difference in THA survivorship between SCFE and age-matched OA patients. Similarly, the Danish National Registry reported a comparable relative risk for revision between SCFE and primary OA during the early and later postoperative period (8,9).

Boyle et al. reported THA outcomes in patients with primary osteoarthritis compared to those with secondary osteoarthritis due to SCFE. There were no significant differences for the revision rate nor the Oxford Hip Score (OHS) in both group in this study. The mean survival rate was approximately 95 % after 4.4 years (10).

Our case showed LLD is 2 cm and postoperatively has an equal leg length with no deficit in nerve function. And the outcome also less pain in the hip and good range motion of the hip.

## CONCLUSIONS

This case report describes a case of chronic SCFE with degenerative joint changes in 22-year-old Male. THA to be a feasible treatment option in young patients with secondary osteoarthritis of the hip due to SCFE. Uncemented THA has good survivorship rate.

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