



Adolescent Female Patient with Hip Pain: Slipped Capital Femoral Epiphysis (SCFE)

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Authors' contributions

This work was carried out in collaboration between all authors. Authors AKW and HL did substantial contributions to conception and design, acquisition of data, drafting the article, revised it critically for important intellectual content, final approval of the version to be published. Authors ZYN and KLP equally managed the analyses of the study and equally contributed the literature searches. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

SCFE is the most common hip disorder affecting the young age between 8 and 16 year old. The prevalence of SCFE is 10 per 100,000 children. The incidence of SCFE is more on boys than girls. We would like to report a case of SCFE with different clinical presentation. A 13-year-old girl presented with the history of pain in the left hip for 1 year and limping for 4 months. The left hip pain became worsened over the last few months together with development of the limping. The pain was also associated with stiffness of the left hip joint and she was unable to squat on the left side. Physical examination including ROM (Range of Movement) and orthopaedic testing were done. X ray and CT scan were done. Patient was diagnosed with SCFE.

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The patient was subsequently treated successfully with In situ fixation. The small incision was made near the left hip and the slipped femoral head was gently rotated and then a screw was inserted to stabilize the bones in their places.

This case is selected for reporting because the incidence of SCFE in girls lower than boys and unusual presentation in this patient because the patient came to hospital after one year and 4 months.

Keywords: Hip disorder; Slipped Capital Femoral Epiphysis (SCFE); adolescent.

1. INTRODUCTION

Slipped capital femoral epiphysis (SCFE) is a posterior and inferior slippage of the proximal part of femoral epiphysis on the femoral neck, occurring during the early adolescent age [1]. The SCFE patient can get the symptom of lower back pain, hip pain or knee pain. Common causes of SCFE may be due to obesity, trauma and, less frequently, endocrine pathologies including hypothyroidism, hypogonadism and pan hypopituitarism [1,2,3].

Slipped capital femoral epiphysis (SCFE) is a type of condition that can occur in a hip of 8 to 15 year old teenagers [1,4]. It is the most common hip disorder found in adolescent age. The condition develop gradually and boys are more prone to this condition than girls. The prevalence for SCFE in the United States is 10.8 cases per 100,000 children [5]. The average age is 12.0 years for boys and 11 years for girls. In children with bilateral involvement, 50–60% present with simultaneous SCFE. Unilateral SCFE become a contralateral SCFE during 18 months period. Young age commonly present with a unilateral SCFE and later develop a bilateral SCFE [3]. In a recent Swedish study, the average annual incidence was 4.4/10000 for girls and 5.7/10000 for boys 9-15 years old reflecting male preponderance [6]. Black children has higher incidence compare to white children possibly due to increased body weight [1,2]. In stable SCFE, the patient is able to walk or bear weight on the affected hip, with or without crutches. Most cases are stable SCFE. Unstable SCFE is a more severe slip. The patient can't able to walk or bear weight, even with crutches. That's why Unstable SCFE requires urgent treatment. Complications are more common in unstable SCFE. The main symptoms of SCFE include hip, groin or proximal thigh pain but a minority of patients may present with distal thigh or knee pain [1,7]. The epiphysis, or the head of femur, slip down and backwards off the neck of the bone at the growth plate. This can cause sudden onset of pain, stiffness and instability in affected hip. Some of the patients may present with knee pain. The clinician can

miss the diagnosis. This can cause delay in diagnosis and further slip of the femoral epiphysis on the femoral neck and progression of deformity [8]. The most severe complication of delayed diagnosis is damage of the arterial supply to the femoral epiphysis resulted in avascular necrosis (AVN) [9,10]. The hip joint examination should be included range of motion (ROM) and orthopaedic testing (orthopaedic assessment and musculoskeletal assessment) [1].

2. CASE REPORT

A 13-year-old girl came to the hospital complained of pain in the left hip for 1 year and limping for 4 months duration. Pain was insidious onset, dull ache in nature, and maximum at the medial aspect of the upper left upper thigh. Pain score was 6/10. The left hip pain became gradually increased and also associated with stiffness and unable to squat on the left side. Pain was aggravated by climbing and long distance walking but relieved by painkiller. There were no swelling, no redness and no loss of sensation over left leg. She had the flat foot since childhood. She had history of overweight during childhood until one and half year back. He denied history of diabetes, hormonal disorder or asthma. There was no past surgical and fracture history either. Her menarche was at 12 years of age. No history of dysmenorrhea. Normal appetite. Bowel and bladder habits were normal. Her mother had history of cardiac problem and father was healthy. Her younger brother had G6PD (glucose-6-phosphate dehydrogenase) deficiency. On general examination, Height 145 cm, weight 50 kg and BMI was 23.8. Blood pressure was 109/63 mmHg, Pulse rate 82 beats per minute, Temperature 37°C. On local examination, antalgic gait was seen. On standing, left lower limbs was externally rotated. No genu varus or valgus deformity of both knee joints. Slight left hip joint flexion deformity was seen. On lying in supine position, there were no skin discoloration, no scar, no wound, no abnormal hair distribution, no sign of inflammation and no muscle wasting. Left lower

limb was approximately short for 3 cm. On inspection, Left hip was flexed for 10° and externally rotated for 20°. Left knee was 10° flexed with 35° plantar flexion. No local rise in temperature. Left anterior hip tenderness present. Right side was normal. There was no tenderness over left knee joints. On movement, left hip flexion was 5 to 90°, extension 0 to 10°, adduction 0°, abduction 10 to 30°, internal rotation 0 to 15°, external rotation 0 to 20°. On real length examination, left upper segment was 1 cm shorter than right side. Investigation reveals normal range of haemoglobin and complete picture. Fasting and post-prandial blood glucose estimation were within normal limit.

The patient was treated successfully with simple in situ fixation technique without closed

reduction. The small incision was made near the left hip and the slipped femoral head was gently rotated. After that one screw was inserted to stabilize the bones in their places. Patient was discharged after 7 days when wound healing was good and no post-operative complication. Rehabilitation was started after surgery, and advised the patient to avoid weight-bearing for 3 months. The patient's was gradually improved. Patient achieved free and independent functioning after 3 months. When we examined the ROM, left hip flexion to 120°, extension to 10°, adduction to 10°, abduction to 35°, internal rotation to 20° and external rotation to 30°. Patient was given follow-up appointment in orthopaedic clinic for 3 months interval up to 1 year and then 6 months interval regularly until 18 years old.

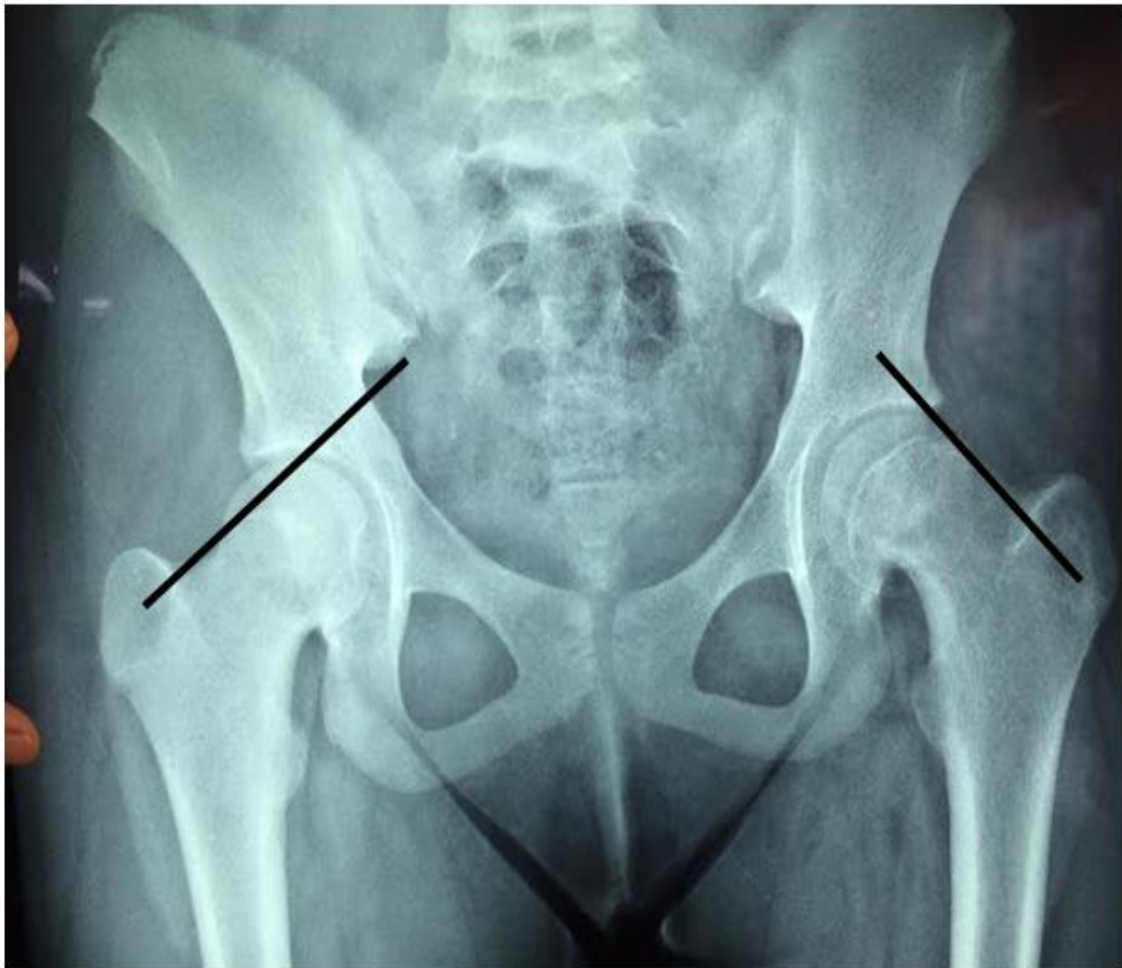


Fig. 1. (A-P views of pelvic): Klein line pass through the right femoral head. It's a normal. Klein line pass just above the femoral head on left side, so it is Trethowan sign positive.



Fig. 2. (Lateral view of left hip) before operation: The femoral epiphysis is tilted backward. Trethowan sign positive

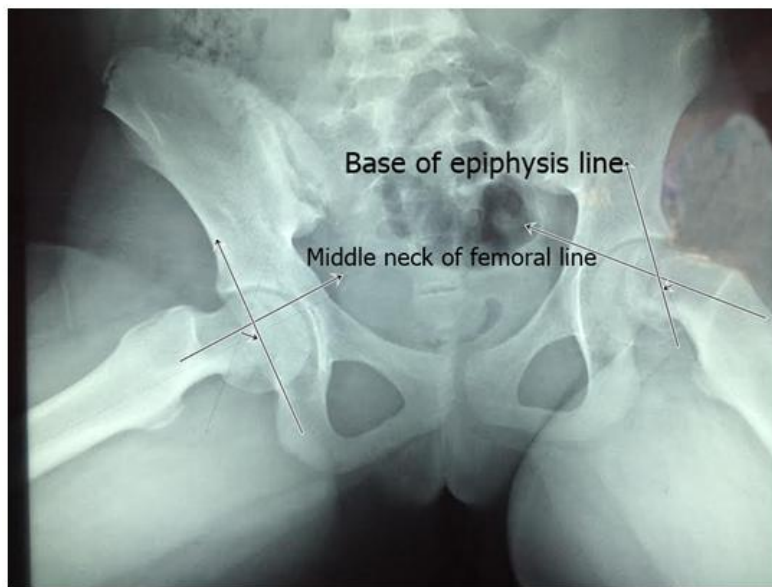


Fig. 3. (Before operation) AP and frog-leg x ray view. This is the most reliable x-ray sign and minor abnormalities can be detected by measuring the angle subtended by the epiphyseal base line and the middle of femoral neck line. The angle on the affected side is less than 90°.

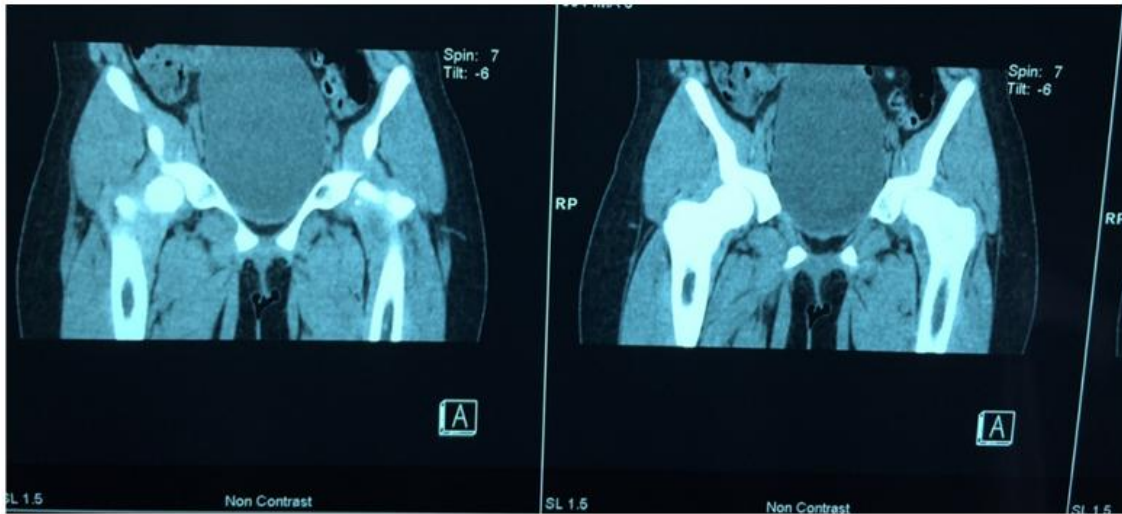


Fig. 4. Plain CT Bilateral Hip

Radiologist impression was widening of epiphyseal growth plate of the left femoral head with irregularity and blurring of physis. There is postero-medial displacement of the left femoral head with increased opacity in the proximal part of left femoral neck. Impression was features above are suggestive of slipped capital femoral epiphysis of left femoral head.



Fig. 5. Post-operative radiograph of patient after operation.

3. DISCUSSION

The typical management for SCFE is surgical reduction by pinning the slipped femoral epiphysis to the metaphysis in situ. [1,7,10]. The femoral shaft rolls into external rotation and the femoral neck is displaced forwards while

epiphysis remains seated in the acetabulum. Disruption occur through hypertrophic zone of the growth plate. The standard AP and Frog-leg radiographic showed that widening and blurring of the margins of the epiphyseal plate, loss of the femoral epiphysis and non-intersection of Klein's line with the lateral aspect of the femoral

epiphysis [2]. Treatment of SCFE aim to prevent the mild displacement of femoral head from slipping. Management of SCFE include in situ fixation and open reduction technique. In situ fixation is the procedure used for patients with stable or mild SCFE. We may make a small incision near the hip, then insert a metal screw across the growth plate to maintain the position of the femoral head and prevent further slippage. The growth plate will close, or fuse in later time. Open reduction should be done in patients with unstable SCFE. We may do an open incision in the hip, then gently manipulate and try to reduce back the head of the femur into its normal anatomic position. One or two metal screws should be inserted to hold the bone in place until the growth plate closes. Since it is invasive and extensive procedure, it may require longer time to recover. Once the bone growth plate is closed, there will be no more slipping of bone. The patient remains in crutches for four to six weeks and need to avoid weight bearing [1,7]. The conservative treatment (Non-surgical treatment) remains controversial. A hip *spica* cast and bilateral short/long leg casts can be used for immobilizing the patient's hip for three months. The method was functional, efficient and also can be used as an alternative therapeutic procedure [11]. The patient should always be given the option, upon the first appointment, to choose from the conservative or surgical treatment. Early diagnosis is important as to reduce the risk of further slippage of the femoral epiphysis and risk of complications such as chondrolysis and degenerative osteoarthritis and AVN in the involved hip later in life [12]. The risk of the surgical intervention should also be explained to the patient and guardian before the procedure. Complications of the procedure include osteonecrosis, chondrolysis, SCFE-induced impingement, and related articular degeneration, fixation failure and deformity progression, growth disturbance of the proximal femur, and development of bilateral disease [4,13]. The role of a chiropractor is important in the immediate and/or long-term management of the SCFE patient, particularly postoperative period. [14].

4. CONCLUSION

SCFE is typically seen during adolescents' period. The classic symptoms are hip or groin pain and sometime knee pain may be presented. The most appropriate plan of management for a patient with SCFE is in situ fixation. Presented in this case report, patient was detected in our

orthopaedic clinic through proper clinical examination and radiographic evaluation. The patient was treated successfully with in situ fixation. The chiropractor has an important role in the management of SCFE especially post-operative period. We have a plan to follow up the patient at least until closure of the physis or until 18 years old.

CONSENT AND ETHICAL APPROVAL

Informed consent was taken from the patient and no ethical clearance is required.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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