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Slipped Capital Femoral Epiphysis in a 23-years Old with Hypopituitarism and Absent Primary Sex Organs

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ABSTRACT

Slipped capital femoral epiphysis (SCFE) is a disease of adolescents with few case reports of the condition occurring in adults, and virtually all of them are attributed to an endocrine disorder. Our patient presented with features that have not been previously described in the literature. We describe a 23-years old female with a SCFE that presented with left knee pain and virtually no medical history. Along with panhypopituitarism, our patient was ultimately found to have absent uterus and ovaries as well as a hypoplastic anterior pituitary, ectopic posterior pituitary, and absent infundibulum. She underwent bilateral in situ percutaneous screw fixation the day after she presented. Additionally, she was treated with levothyroxine, prednisone, estrogen and medroxyprogesterone replacement therapy. Approximately twenty months later she underwent an intertrochanteric osteotomy in order to address her residual femoral deformity. She reported a significant decrease in her pain following the procedure and was able to get further medical care following her orthopedic diagnosis.

KEYWORDS

Endocrine disorder; Slipped capital femoral epiphysis; Orthopedic diagnosis; Medical care

INTRODUCTION

Slipped capital femoral epiphysis (SCFE) is a disease of adolescents that is estimated to occur in approximately 1 per 1000 to 1 per 10,000 children and young adults [1,2]. There are few case reports of the condition occurring in adults, and virtually all of them are attributed to an endocrine disorder. The most common endocrine disorders described are hypothyroidism and hyperparathyroidism. There are also some syndromes associated with short stature and endocrine disturbances that have been reported with the condition, such as Russell-Silver syndrome [3]. The pathology and pathomechanics of SCFE are well known. The proximal femoral physis is prone to shear stress which puts it at risk for slippage. SCFE may result in patients younger than ten years old with certain risk factors such as obesity and a rapid growth spurt [4]. The role of growth hormone, sex hormones, parathyroid, and thyroid hormones have all been postulated in the development of SCFE as well [5,6]. Delayed skeletal maturation is a common theme in patients with endocrine abnormalities and it has been estimated that up to 7% of patients with SCFE have an endocrine disorder [5].

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Loder and Greenfield have outlined that atypical SCFE should be suspected whenever it presents in children that are younger than ten, older than 16, or weigh less than the 50th percentile for their age and gender [7]. Whenever a patient with atypical or idiopathic SCFE presents to an orthopedist, there should be a high suspicion of endocrine disorders and further lab testing is required. We present a case of atypical SCFE occurring in an otherwise normal appearing 23-years old female.

CASE REPORT

A 23-year-old female presented to the orthopaedic surgery clinic with progressive left knee and hip pain over a five-month period without an inciting injury. She reported no medical problems but noted that she had seen an endocrinologist when she was 5-year-old due to small stature and was treated with growth hormone at that time. She had not begun menstruation and was not taking any medications at the time of presentation.

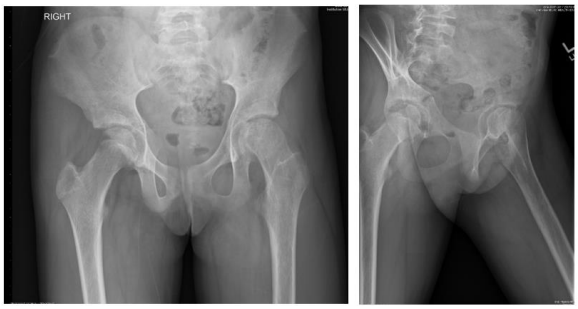

Figure 1: (A) Anteroposterior and (B) frog lateral radiograph of the left hip demonstrating a slipped capital femoral epiphysis.

On physical exam, the patient was average height with a recorded height of 160 cm and a weight of 47 kg. Her blood pressure was low-normal at 94/62 mmHg. She appeared much younger than her stated age. She ambulated with a severe antalgic gait. She had an externally rotated left lower extremity. Foot progression angle was at 45° of external rotation on the left compared to neutral right side. There was reproducible left hip pain with internal and external rotation. She had 45° of left-sided obligate external rotation with hip flexion. She had hip flexion to 80° on the left side, compared to 100° on the right. Radiographs demonstrated a left slipped capital femoral epiphysis with mild bilateral hip dysplasia and open proximal femoral physes (Figure 1A and Figure 1B).

The next day, the patient underwent in situ percutaneous screw fixation of bilateral hips under fluoroscopic guidance. Her right hip was prophylactically fixed due to the risk of developing a SCFE in the setting of a likely endocrine disorder (Figure 2A and Figure 2B). Postoperatively, the patient was made touchdown weight bearing on the left side and weight bearing as tolerated on the right. She was progressed to protected weight bearing with crutches to her left side two weeks later and weight bearing as tolerated 6 weeks after surgery.

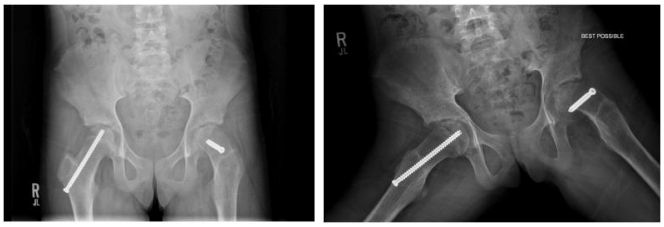

Figure 2: (A) Post-fixation anteroposterior and (B) lateral radiographs of bilateral hips demonstrating screw placement and alignment.

The patient was referred to endocrinology, and a full workup revealed a normal 46XX karyotype and panhypopituitarism. A CT of her abdomen and pelvis revealed absent ovaries and uterus. An MRI of her brain demonstrated an ectopic posterior pituitary with no infundibulum and a hypoplastic anterior pituitary. She was started on prednisone, levothyroxine, estrogen, medroxyprogesterone, and growth hormone replacement therapy.

Four months after her index surgery, she had resolution of hip and groin pain. However, her range of motion remained limited with only 70° of hip flexion and 40° of obligate external rotation. Radiographs of her left hip demonstrated a residual deformity with a CAM lesion, as well as a healed slip and closed physes. Given that her hip deformity limited her range of motion, a plan was

made to perform a femoral head/neck osteochondroplasty with an intertrochanteric flexion osteotomy. (Figure 3A andFigure 3B). After the surgery, the patient was made touchdown weight bearing on her left lower extremity for six weeks after the procedure.

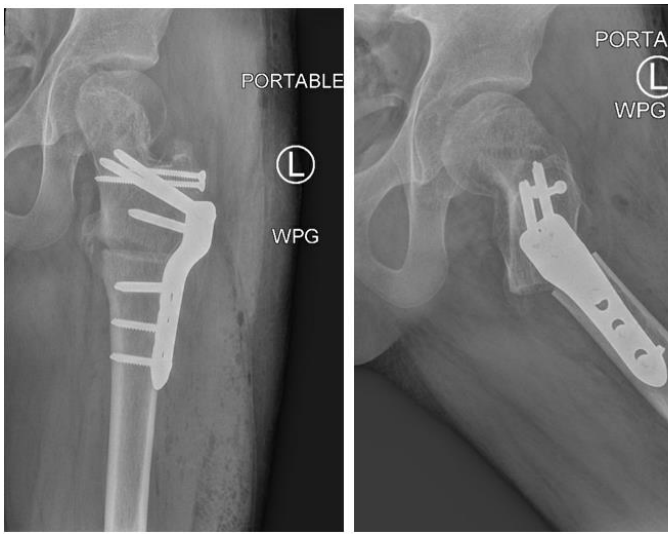

Figure 3: (A) Post-reconstruction anteroposterior and (B) lateral radiograph of left hip following surgical hip dislocation, open head/neck osteochondroplasty and flexion intertrochanteric osteotomy and locking plate stabilization

At her 5-months postoperative visit, she reported persistent pain over the lateral aspect of her left hip. She had tenderness to palpation over the greater trochanter. Her range of motion had improved with flexion 100°, and her hip could be kept at neutral rotation when flexed. She continued to report lateral thigh pain at subsequent clinic visits, likely due to symptomatic hardware. She underwent hardware removal approximately one year after her surgery. The patient was doing well at her three-week follow up visit with no further complaints.

3. DISCUSSION

There are few case reports where SCFE is described to occur in adults. An Italian case report and literature review from 2016 characterized every SCFE case published prior to 2015 in people equal or older than 19-years old at the time of diagnosis. Virtually all of the cases are adults with endocrine disorders and/or brain tumors [8]. Brady and Price also described a 22-years old patient who suffered a SCFE with a large pituitary tumor that was causing panhypopituitarism [9]. Our patient was suffering from functional panhypopituitarism, but what makes the case unique is that she was also missing her uterus and ovaries in the setting of a normal female karyotype. This may represent a previously undiagnosed congenital syndrome that requires further elucidation.

Our case highlights the importance of interprofessional collaboration. After our patient's initial fixation, she suffered a short course of adrenal crisis as she had not been medically treated for her endocrine disorder. Our patient was able to get further medical care that she needed because of referrals made to other providers after her presentation to the orthopaedic clinic. Her endocrinologists started her on thyroid and sex hormone replacement, which promoted fusion of her epiphysis and ultimately allowed us to perform her reconstruction surgery. She was also started on prednisone and given stress dose steroids after her reconstructive surgery, ultimately preventing another adrenal crisis. Even though our patient was relieved of her pain after her initial fixation, her functional status did not improve with fixation alone. Our case highlights the importance of addressing residual deformities that may co-exist with SCFE in order to optimize the functional status of these patients.

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