

A Case of Slipped Capital Femoral Epiphysis in Association With Craniopharyngioma

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Introduction: Slipped capital femoral epiphysis is characterized by the slippage of the proximal femoral epiphysis on the metaphysis, which is sometimes associated with an underlying endocrine disorder. Panhypopituitarism due to craniopharyngioma has been reported several times. We report a case of craniopharyngioma recurrence leading to slipped capital femoral epiphysis.

Case Presentation: A 28-year-old man diagnosed with recurrent craniopharyngioma presented with slipped capital femoral epiphysis. He was treated with gentle manipulation, capsulotomy, and placement of one screw as fixation per side. No complications showed up in a follow-up duration of 4 months.

Conclusions: We underscored the importance of endocrinologic disorders in craniopharyngioma cases. Such disorders should be taken into consideration and be followed up.

Keywords: Slipped Capital; Femoral Epiphysis; Craniopharyngioma

1. Introduction

Slipped capital femoral epiphysis (SCFE) classically presents in the age group of 10 - 15 years, with the peak age being 13 years in boys and 11.5 years in girls (1). The condition is defined as the posterior and inferior slippage of the proximal femoral epiphysis on the metaphysis (femoral neck), which occurs through the epiphyseal plate (growth plate) (2). In some cases, SCFE is associated with an underlying endocrine disorder (3). The presentation of SCFE rather than the expected age range should be considered as a risk factor for an underlying endocrinopathy (4).

Brain tumors located in the hypothalamus-pituitary area can induce hormonal disorders. One of these tumors is craniopharyngioma, which is the most frequent tumor within the hypothalamic-pituitary region, constituting between 6% - 9% of all brain tumors in the population of developmental age (5). In cases of either lesions of the pituitary or pressure exerted onto the gland, its stalk, or onto the hypothalamus, endocrinologic symptoms occur and they are associated with the abnormal secretion of the hypothalamic-pituitary hormones (6).

Tumor recurrence is a very common event in the management of craniopharyngioma, even after complete resection and postoperative radiotherapy (7). Its recurrence is considered as a major cause of morbidity in long-term outcomes (8). We hereby report the clinical presentation of a 28-year-old male with simultaneous unilateral SCFE

predisposed by recurrent craniopharyngioma hormonal disorders.

2. Case Presentation

A 28-year-old man referred to our department with a 7-week history of left hip limping, difficulty walking, and inability to bend forward. He had aided waddling gait and poor tolerance of weight bearing. There was no history of any major trauma. His vital signs were normal. The examination of the hip elicited an impaired restriction of flexion and both internal and external rotation, with a 2-cm shortening of the left leg. A Harris hip score of 65.5 was achieved by the patient. His distal neurovascular status was intact (Figure 1).

Other examinations showed poor secondary sexual characteristics with a Tanner's pubertal and axillary stage of 2. He worked in an automobile repair shop and had normal social activities. A survey of his past medical history showed that at age of 17 years, blurred vision, meningeal signs, and abnormal secondary sexual development were noted; and after investigations, brain magnetic resonance imaging showed a lobulated intra- and suprasellar mass, 38 × 32 × 24 mm in diameter, with extension posteriorly into the interpeduncular cistern and extension superiorly and insinuation into the third ventricle. Consequently, in December 2001, he underwent brain surgery for craniopharyngioma. Ten years

later, his previous symptoms recurred, and in April 2011, he underwent a second brain surgery for tumor recurrence. At the meantime, he had been followed up by an endocrine clinic.

According to the patient's past history, he was born full term with a birth weight of 3.5 kg and his early development was described as normal (menarche was at age of 14 years). Since that age, he had always weighed between 49 and 57 kg. During these years, he was under medical therapy for hormonal disorders. There was no history of delayed dental maturation, hyposmia, or a family history of delayed puberty. He had no midline defects. Complete pituitary evaluation is depicted in Table 1.

In 17 July 2013, the patient was admitted to our hospital, and we performed the standard treatment for SCFE: fixation with a single screw and a prophylactic fixation in the contralateral hip (Figure 2).

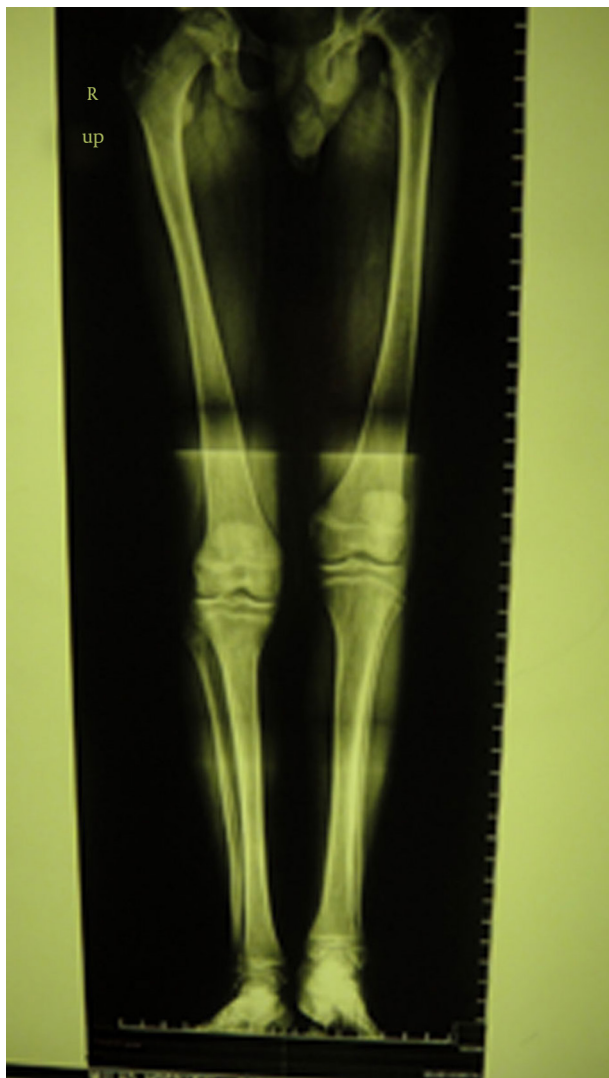


Figure 1. Patient's Scanogram on Admission With a 2-cm Shortening of the Left Leg

Table 1. Complete Pituitary Evaluation

Parameter	Value	Status
TSH	10.3	High
Free T4	1.8	Low
FBS	89	Normal
Free T4	3	Low
LH	< 0.2	Low
FSH	< 0.25	Low
Prolactin	18.8	High
Testosterone	0.12	Low
Cortisol	0.7	Low
IGF-1	32.6	Low



Figure 2. Patient's Radiograph on the Postoperative Day

Postoperatively, the patient had an uneventful recovery and was discharged 2 days after surgery with instructions for weight-bearing status and followed up through both orthopedic and endocrine clinics. He came on regular follow-up visits, and based on clinico-radiological evidence of union, full weight-bearing walk was advised in the fourth month.

3. Discussion

SCFE occurs when shearing forces applied to the femoral head exceed the strength of the capital femoral physis (9). The factors that weaken the physeal plate are not fully clarified, but are thought to include adolescence growth, trauma, obesity, inflammatory changes, genetic predisposition, and endocrine and metabolic disorders (9, 10). Hypothyroidism and hypogonadism are the two most prevalent disorders leading to SCFE at atypical times. Androgens indeed increase the strength of the physeal plate, and low levels of androgens may delay puberty and weaken the physeal plate. Low androgen levels may, therefore, be a possible etiologic factor for SCFE. The most

common cause of hypopituitarism in this setting is a tumor placing pressure on the gland and thus reducing the secretion of its hormones (10). Although only 5.2% - 6.9% of patients with SCFE are associated with endocrinopathy, there are some clinical features that should alert clinicians to obtain an endocrinologic evaluation prior to surgical treatment: young age at presentation; bilateral disease; and the presence of a valgus SCFE (11). SCFE usually occurs in adolescents (10 - 16 years), especially during the growth spurt. SCFE in adults is uncommon, but has been reported in a few cases.

The literature contains only a few reported cases of SCFE in association with panhypopituitarism after the treatment of a craniopharyngioma in adult patients (12-14). The presentation of delayed-onset SCFE in association with a pituitary tumor was seen in one study, which reported a large benign pituitary tumor causing severe panhypopituitarism and giving rise to the disorder of delayed secondary growth (15).

Our patient presented with SCFE at age of 28 years, which was an atypical age for presentation and favored the possibility of the presence of underlying endocrinopathy. Also, there was no history of major trauma, denoting an underlying factor to explain this event.

Craniopharyngioma is a slow-growing, extra-axial, epithelial-squamous, calcified cystic tumor arising from the remnants of the craniopharyngeal duct and/or Rathke cleft, and occupying the sellar region (16). This tumor most frequently arises in the pituitary stalk and projects into the hypothalamus. The time interval between the onset of symptoms and diagnosis ranges from 1 - 2 years. The most common presenting symptoms are headache (55% - 86%), endocrine dysfunction (66% - 90%), and visual disturbances (37% - 68%) (17). Gross total surgical removal is the treatment of choice. After surgical resection, recurrence usually occurs in the region of the original tumor bed. The recurrence rates can be as high as 15% (18).

Osteonecrosis and chondrolysis are two important complications of SCFE (19). In our patient, however, there was no sign of osteonecrosis or chondrolysis.

It has been demonstrated that placing a prophylactic screw in the contralateral hip is a wise approach toward SCFE treatment (20). Accordingly, we treated our patient with gentle manipulation, capsulotomy, and placement of one screw as fixation per side.

Careful clinical examination and hormonal assessment are required for all patients with SCFE to exclude an associated endocrinopathy. Hypothyroidism should be screened first in all such patients as primary hypothyroidism, the commonest endocrine cause, may cause the retardation of osseous development and delay in epiphyseal plate closure.

In summary, we described a 28-year-old man diagnosed with panhypopituitarism due craniopharyngioma with a presentation of SCFE after tumor recurrence. We, thus, highlighted the significance of panhypopituitarism in craniopharyngioma cases, which may lead to SCFE.

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Authors' Contributions

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