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Case Report

Bilateral Slipped Capital Femoral Epiphysis - A Rare Presentation of Primary Hypothyroidism

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ABSTRACT

Slipped capital femoral epiphysis (SCFE) typically affects adolescents, characterized by the displacement of the femoral head from the neck at the hip joint. SCFE is uncommon beyond 15–17 years of age, as the proximal femoral physis typically closes by this time in boys. However, endocrine disorders like hypothyroidism, which delay physeal closure, can result in SCFE in adults.

Primary hypothyroidism, characterized by insufficient thyroid hormone production, has other systemic effects with SCFE being unrecognized and a rare presentation. This case report aims to present a rare occurrence of bilateral SCFE in the context of primary hypothyroidism. We present the case of a 19-year-old boy who initially presented with symptoms of bilateral hip pain and limited mobility. Diagnostic evaluation revealed concurrent primary hypothyroidism, confirmed through thyroid function tests. Subsequent imaging confirmed the presence of bilateral slipped capital femoral epiphysis. The patient received appropriate thyroid hormone replacement and is planned for surgical intervention for SCFE. This case highlights the importance of considering underlying endocrine disorders, such as primary hypothyroidism, in the differential diagnosis of atypical presentations of SCFE. Further research is needed to understand the exact pathophysiological mechanisms by which primary hypothyroidism causes bilateral SCFE.

Keywords: Slipped capital femoral epiphysis; Primary hypothyroidism

Introduction

Slipped Capital femoral epiphysis (SCFE) is a condition characterized by the displacement of the capital femoral epiphysis from the metaphysis through the femoral epiphyseal plate at the hip joint, primarily affecting adolescents during periods of rapid growth[1]. It is more commonly observed in boys than girls[2]. Though the etiology is multifactorial common causes include obesity, Trauma and growth surge during puberty[3] Occasionally it is associated with endocrine disorders, including hypothyroidism, growth hormone supplementation, hypogonadism and panhypopituitarism. SCFE is rare after 15-17 years but may occur in adults due to delayed physeal closure from endocrine disorders like hypothyroidism.

While primary hypothyroidism is known to affect multiple organ systems, its association with SCFE is relatively uncommon and has not been extensively reported in the literature.

This case report aims to present a rare occurrence of primary hypothyroidism presenting as bilateral SCFE. We highlight the importance of considering underlying endocrine disorders in the differential diagnosis of atypical presentations of SCFE.

Understanding this association may provide insights into the pathophysiology and optimal management of both primary hypothyroidism and SCFE.

Case Report

A 19-year-old boy who was born out of nonconsanguineous marriage through a normal vaginal delivery at term with an uneventful prenatal and postnatal period with normal developmental milestones presented with non-traumatic limping and bilateral hip pain which worsened over the last 6 months.

There was a history of weight gain (7 kg in the last 6 months), constipation, fatigue, dry skin and increased sleepiness.

No significant family history was noted.

On Examination

Physical examination revealed short stature (height: 156 cm; mid-parental height: 177.5 cm) with a BMI of 22.5 kg/m². Clinical findings included dry, coarse skin, facial puffiness, periorbital swelling, a diffuse smooth goiter and delayed relaxation of deep tendon reflexes. Bilateral testicular volume was normal (25 cc), with a stretched penile length of 9 cm.

Laboratory investigations showed markedly elevated TSH levels (772 mIU/mL), with low T4 and T3 concentrations. Prolactin, cortisol, testosterone levels and calcium profile were within normal limits. Bone age assessment showed delayed skeletal maturity and pelvic imaging (x-ray pelvis) confirmed bilateral slipped capital femoral epiphysis (SCFE) **(Table 1)**.

The patient was diagnosed with primary hypothyroidism and initiated on levothyroxine supplementation at 50 mcg/day. He is scheduled for corrective osteotomy to address SCFE **(Figure 1)**.

Table 1: Biochemical Investigations.

Parameter	Values	Reference range
TSH	772	0.5 - 5 mIU/ml
Free T4	< 0.88	5.2 - 11 mcg/dl
Prolactin	27.4	< 20 ng/ml
8am cortisol	6	5-15 mcg/dl
ACTH stimulated cortisol	21.2	>18 mcg/dl
Total Testosterone	281.3	200-970 ng/dl
LH	0.996	0.8-8.7 mIU/ml
FSH	8.96	1.2-9.6 IU/L
Calcium	9.3	8.5-10.5 mg/dl
Phosphorous	4.2	2.5-4.5 mg/dl

Treatment

He was initiated on levothyroxine therapy (50 mcg/day) and is being planned for corrective osteotomy to address the bilateral slipped capital femoral epiphysis (SCFE).

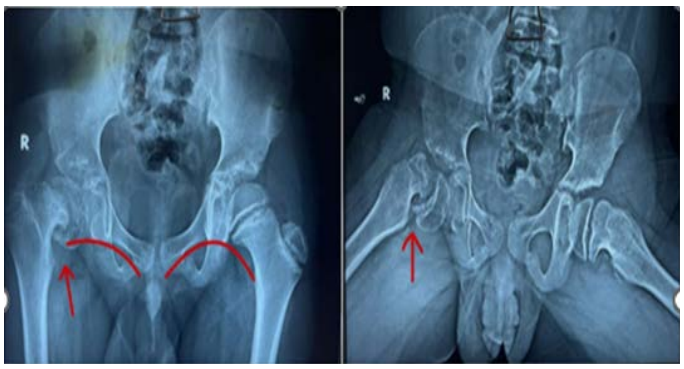

Figure 1: The Antero-Posterior and Frog Leg Lateral Radiograph of Pelvis with Both Hips Showing Evidence of Severe Chronic Stable Scfe On The Right Hip With A Pre &Post Slip On The Left Hip. It Also Shows Evidence Of Open Triradiate, Capital Physis, Greater Trochanter In Both The Hips-Which Is Unusual In A 19 Year Old.

Discussion

Slipped Capital femoral epiphysis (SCFE) is a rare disorder with a prevalence of 10.8 cases per 100,000 children[2,4]. It primarily affects the adolescent age group. However, adults can be affected if epiphyseal closure is delayed because of an underlying endocrine disorder like hypothyroidism.

Hypothyroidism is an endocrine condition marked by insufficient production of thyroid hormones, which play a crucial role in normal growth, development and bone metabolism[1]. Thyroid hormone deficiency in children results in delayed endochondral and intramembranous ossification, as well as hypoplasia of the epiphyseal plate (growth plate). Additionally, it impairs the growth hormone/insulin-like growth factor axis. Recent studies in animals, including hypothyroid swine, have shown a notable reduction in the expression of proteoglycans and type X collagen in the growth plate[5].

In hypothyroidism, impaired chondrocyte function can delay growth plate closure and increase the risk of SCFE.

Furthermore, primary hypothyroidism often coexists with other endocrine disorders, such as growth hormone deficiency or hypopituitarism, which could also contribute to the development of SCFE[6,7]. Loder et al. studied 85 individuals with SCFE associated with endocrine disorders and reported that 40% were diagnosed with hypothyroidism, 25% with growth hormone deficiency and 35% with other conditions, including panhypopituitarism and hyperparathyroidism[8]. In our patient, a comprehensive hormonal workup to rule out other hormonal causes showed no abnormalities.

Management of primary hypothyroidism presenting with bilateral SCFE requires a holistic approach. Treatment focuses on optimizing thyroid hormone levels through hormone replacement. Surgical intervention is frequently required to stabilize the femoral head and prevent further slippage.

This case report emphasizes the importance of thyroid function screening in patients with SCFE, particularly those presenting in adulthood, with short stature or bilateral involvement.

More case reports will help elucidate the pathophysiology and potential risk factors for SCFE in individuals with primary hypothyroidism.

Conclusion

SCFE should be considered in adults with bilateral hip pain and limping, with a focus on evaluating for endocrine associations, particularly primary hypothyroidism, which is a treatable condition.

SCFE is a preventable disorder in these patients if diagnosed early.

Conflicts of Interests

Nil

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