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Case Report

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Slipped Capital Femoral Epiphysis Unmasking Pituitary Gigantism in a 14-Year-Old Boy: Case Report of a Simple Fall That Revealed a Giant Secret

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Abstract

Background: Pituitary gigantism is a rare endocrine disorder that can present with various orthopaedic complications. Slipped capital femoral epiphysis (SCFE) is a serious complication occurring in 30-60% of patients with growth hormone excess. ***Case Presentation:*** We report a 14-year-old boy who presented with left hip pain and difficulty weight-bearing following a trivial fall. Clinical examination revealed a tall boy with acromegalic features including large hands, feet (shoe size 48), and prognathism. Pelvic X-ray confirmed left SCFE. Further evaluation revealed rapid growth over three years, visual disturbances, and headaches. Hormonal studies showed elevated IGF-1 (843 ng/ml) and prolactin (835.08 µg/L). Brain MRI demonstrated a suprasellar mass with parasellar extension. The patient underwent closed reduction and pinning of the affected hip with prophylactic pinning of the contralateral hip, followed by endoscopic transsphenoidal resection of the pituitary adenoma. ***Conclusion:*** This case highlights the importance of screening adolescents with SCFE for underlying endocrinopathies. Early recognition and multidisciplinary management involving orthopaedics, endocrinology, neurosurgery, and ophthalmology are essential for optimal outcomes in pituitary gigantism.

Keywords: ***Pituitary gigantism, slipped capital femoral epiphysis, growth hormone, pituitary adenoma, adolescent.***

Introduction

Pituitary gigantism is a rare endocrine disorder characterized by excessive growth hormone (GH) secretion from a pituitary adenoma during childhood or adolescence, before epiphyseal closure [1]. This condition affects approximately 3-4 cases per million people annually, with the majority of cases caused by GH-secreting pituitary adenomas [2]. The clinical manifestations of pituitary gigantism extend beyond accelerated linear growth and include various orthopaedic, ophthalmologic, and metabolic complications that can significantly impact patient outcomes if not recognized and treated promptly [3].

Slipped capital femoral epiphysis (SCFE) represents one of the most serious orthopaedic complications associated with pituitary gigantism, occurring in 30-60% of affected patients [4]. The pathophysiology involves weakening of the proximal femoral growth plate due to rapid growth spurts and hormonal influences, predisposing patients to displacement of the femoral head even with minimal trauma [5]. This association is particularly important for clinicians to recognize, as SCFE may be the initial presenting feature that leads to the diagnosis of an underlying endocrinopathy [6].

The diagnosis of pituitary gigantism requires a combination of clinical assessment, biochemical evaluation, and neuroimaging studies. Elevated insulin-like growth factor-1 (IGF-1) levels serve as the primary screening test, while magnetic resonance imaging (MRI) of the pituitary gland is essential for identifying and characterizing pituitary adenomas [7]. Associated complications such as visual field defects due to optic chiasm compression and hypogonadism due to mass effect on normal pituitary tissue are common and require multidisciplinary management [8].

Early recognition and treatment of pituitary gigantism are crucial for preventing irreversible complications and optimizing long-term outcomes. The management approach typically involves surgical resection of the pituitary adenoma, with adjuvant medical therapy when complete resection is not achievable [9]. However, the complexity of this condition necessitates a coordinated multidisciplinary approach involving endocrinology, neurosurgery, orthopaedic surgery, and ophthalmology specialists [10].

This case report presents a rare complication of a 14-year-old boy who initially presented with SCFE following a trivial fall, which subsequently led to the diagnosis of pituitary gigantism- a simple fall that revealed a giant secret. The case highlights the importance of maintaining high index of clinical suspicion for underlying endocrinopathies in adolescents with atypical orthopaedic presentations and demonstrates the value of multidisciplinary care in managing complex endocrine disorders.

Case Report

The patient is a 14year old boy who presented with difficulty in bearing weight on the left lower limb of four days following trivial fall. There was associated severe left hip pain which was worsening

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with standing and relieved by rest and analgesic. There was no open injury or fever. He had initial care in a primary health care facility where he was given a dose of analgesic injection and balm applied to the left hip by the mother. The patient presented to our facility for expert care because there was no improvement of symptoms. There was no known comorbidity, however, there was history of sudden increase in growth few months before presentation, and he is a third child in a polygamous family setting.

Findings on examination revealed a young boy, big for age with a large disproportionate lower jaw, large hand and foot (shoe size 48), Left lower limb was in external rotation with reduced range of motion.

Pelvic X-ray done showed slippage at the left subcapital femoral head. A diagnosis of left Slipped capital femoral epiphysis on a suspected background growth hormonal disorder(gigantism) from pituitary tumour was made (**Figure 1**). Skin traction with 5kg weight was applied, oral analgesic was administered. and he was worked up for surgery.

Clinical Photograph

Figure 1

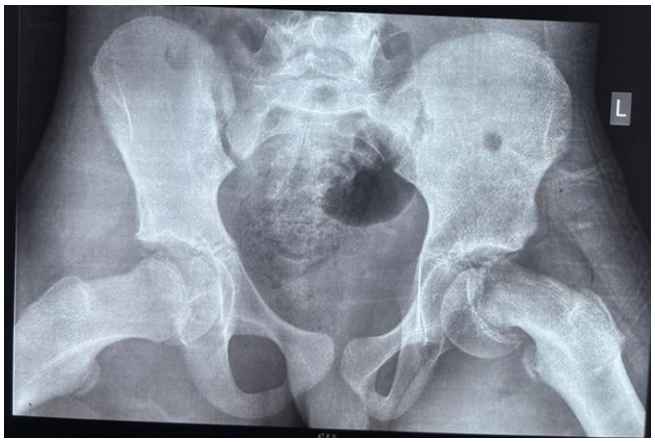

Figure 2: Pelvic X-ray, frog lateral view of both hips

On further review by the paediatric endocrinology team. They found out that the rapid growth was noticed at 11 years of age from his shoe size 40 and he is currently wearing size 48 in a span of 3 years. There was also history of intermittent headache, mood swing and poor vision but no seizure or loss of consciousness. Further examination revealed big for age boy with poor peripheral vision. An assessment of Gigantism secondary to query suprasellar mass was made. Brain magnetic resonance imaging done showed suprasellar mass that is isointense on T1 and T2 images and contrast enhancing. There was bilateral parasellar extension and mass effect on the floor of the 3rd Ventricle (**Figure 3**)- Brain MRI

Figure 3

Table 1: Full hormonal profile result

Test	Results	References
S-IGF1 (ng/ml)	843.0	177 - 507
S-IGFBP (ug/ml)	11.5	3.3 - 10.0
S- Lutropin (IU/L)	1.09	1.24 -8.62
S-Prolactin (ug/L)	835.08	2.64 - 13.13
(PM) S- Cortisol nmol/l	27	79-477
(AM) S- Cortisol nmol/l	75	101-535
Total Testosterone (nmol/L)	Less than 0.4	11.2-34.7
S- 17b- Oestradiol E2 (pmol/L)	1	<73-173
S- Follitropin FSH (IU/L)	2.98	1.27-19.26

He was also reviewed by the neurophtamology team with Visual acuity- right eye (6/15) and Left (6/6) using Snellen chart. Visal field analysis was also done Figure 4. An assessment of bilateral hemianopia secondary to pituitary tumour was made.

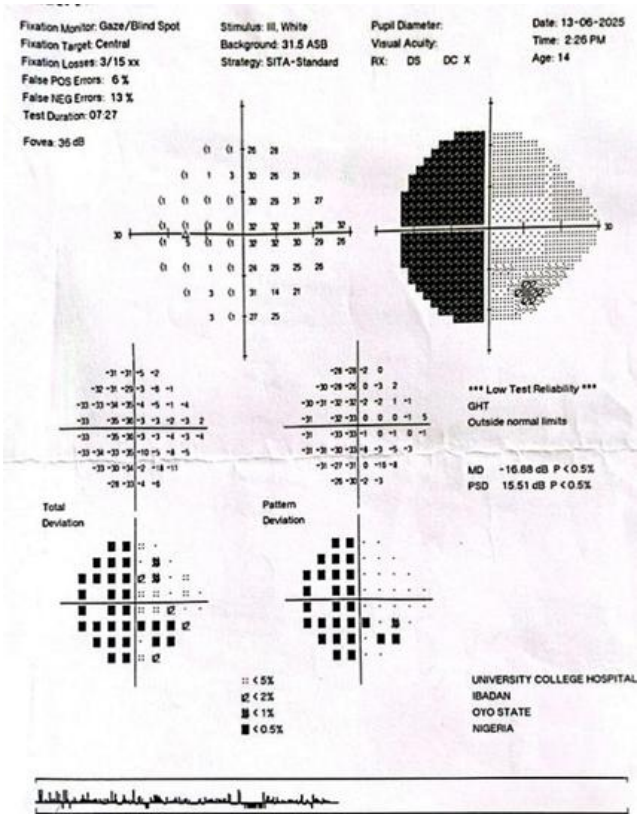

Figure 4

He had closed reduction and pining of the left SCFE and prophylactic pining of the Right hip. The post operative check X-ray figure 5. We had challenges getting appropriate lengths of partially treaded screws for this patient as his bones are bigger and longer than those of average patients. We used the screws with the longest length available in our facility. This should be taken into consideration to source for extra longer screws when treating this condition in this type of patient.

Subsequently, the patient had endoscopic intranasal transphenoidal resection of mixed pituitary macroadenoma during the same admission. Patient is doing well on follow up at the surgical outpatient.

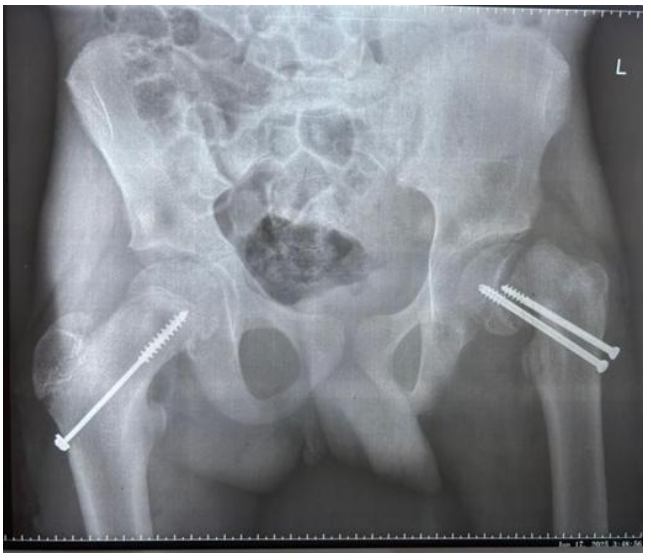

Figure 5

Discussion

This case highlights the critical importance of recognizing underlying endocrinopathies in adolescent patients presenting with orthopaedic complications. Slipped capital femoral epiphysis (SCFE) is a well-recognized complication of growth hormone (GH) oversecretion, occurring in approximately 30-50% of patients with pituitary gigantism [1]. The rapid growth spurts associated with GH hypersecretion weaken the growth plate, predisposing these patients to bilateral SCFE, often with minimal trauma [2].

Our patient's presentation exemplifies the classic triad of pituitary gigantism: accelerated linear growth, characteristic physical features of acromegaly (enlarged hands and feet), and associated complications [3]. The rapid increase in shoe size from 40 to 48 over three years, combined with his tall stature relative to age, should have raised suspicion for an underlying endocrinopathy earlier in his clinical course.

The hormonal profile demonstrated classic findings of GH excess with elevated IGF-1 (843 ng/ml against a normal value of 177-507 ng/ml) and IGFBP-3 levels [4]. The significantly elevated prolactin (835.08 µg/L) suggests a mixed GH-prolactin secreting adenoma, which occurs in approximately 25% of GH-secreting pituitary tumors [5]. The suppressed gonadotropins and low testosterone levels are consistent with the hypogonadotropic hypogonadism commonly seen in large pituitary adenomas due to mass effect [6].

The MRI findings of a suprasellar mass with parasellar extension and compression of the third ventricle floor explain the visual field defects observed. Although, bitemporal hemianopia is the classic visual field defect in pituitary macroadenomas, occurring in 70-80% of patients with tumors extending above the sella turcica [7].

The multidisciplinary approach employed in this case demonstrates best practice in management. Early orthopaedic stabilization with in-situ pinning of the affected hip and prophylactic pinning of the contralateral hip is the standard of care for SCFE in the setting of endocrinopathy, given the high risk of bilateral involvement [8]. The involvement of pediatric endocrinology and neuro-ophthalmology teams ensured comprehensive evaluation and management of all aspects of this complex condition.

Delayed diagnosis of pituitary gigantism can result in irreversible complications including joint problems, cardiovascular disease, and permanent visual field defects [9]. Early recognition and treatment are crucial for optimizing long-term outcomes, particularly regarding final adult height and prevention of systemic complications [10].

Conclusion

This case underscores the importance of maintaining a high index of suspicion for underlying endocrinopathies in adolescents presenting with orthopaedic complications, particularly SCFE. The combination of rapid growth, characteristic physical features, and minimal-trauma fractures should prompt immediate endocrinologic evaluation. A multidisciplinary approach involving orthopaedic surgery, paediatric endocrinology, neurosurgery, and neuro-ophthalmology is essential for optimal management of pituitary gigantism and its associated complications.

Recommendations

1. Screen all adolescents with SCFE for endocrinopathies using IGF-1 levels and growth assessment [20].
2. Establish multidisciplinary protocols involving orthopedics, endocrinology, neurosurgery, and ophthalmology for pituitary gigantism management [22].

3. Educate families about signs of hormonal excess and importance of monitoring growth patterns [23].
4. Ensure early referral to specialized endocrine centers for complex cases [25].

Declarations

Ethics approval and consent to participate

Written informed consent was obtained from the patient and his parents/guardians for publication of this case report and any accompanying images. The case presentation and management followed standard clinical protocols, and patient confidentiality was maintained throughout.

List of abbreviations

- SCFE: Slipped Capital Femoral Epiphysis
- GH: Growth Hormone
- IGF-1: Insulin-like Growth Factor-1
- IGFBP-3: Insulin-like Growth Factor Binding Protein-3
- MRI: Magnetic Resonance Imaging
- FSH: Follicle Stimulating Hormone

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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Authors' contributions

All authors were members of the multidisciplinary managing team involved in the patient's care. MOO and JOM-B conceived the case report and drafted the initial manuscript. MJB served as the corresponding author and coordinated the multidisciplinary care. RAO contributed to the orthopaedic management and surgical intervention. OFA participated in the clinical evaluation and follow-up care. SOO assisted in the diagnostic workup and patient management. OOA contributed to the endocrinologic assessment and hormonal evaluation. JT participated in the neurosurgical management and transsphenoidal resection. All authors contributed to the critical revision of the manuscript, read and approved the final version for publication.

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