

## ■ CASE REPORT

# Slipped upper femoral epiphysis in Hashimoto's thyroiditis in a 29-year-old man

A. T. Oommen,  
V. Madhuri,  
T. V. Paul

From Christian  
Medical College,  
Vellore, Tamil Nadu,  
India

**Slipped upper femoral epiphysis (SUFE) with an open physis is rare in an adult and the condition may present without prior diagnosis of an underlying medical condition. We have treated a 29-year-old man with bilateral SUFE associated with autoimmune hypothyroidism. The management was delayed and complicated by co-existing autoimmune chronic active hepatitis. He underwent thyroxine therapy and bilateral pinning in situ with a single ASNIS screw. Closure of the physis occurred after five months on the right side. The left side required a further corrective intertrochanteric osteotomy, and it was only after 13 months that complete fusion of this physis was seen. The case highlights the need to consider endocrine and metabolic conditions in atypical presentation of SUFE.**

Slipped upper femoral epiphysis (SUFE) is caused by mechanical insufficiency of an abnormally weak proximal femoral physis or by abnormal loading of a normal physis.<sup>1,2</sup> Conditions that weaken the physis include endocrine abnormalities, systemic diseases such as renal osteodystrophy, and radiation therapy.<sup>1</sup> Abnormal loading is a result of mechanical factors, including obesity and anatomical variation in the proximal femur and acetabulum.<sup>1</sup> Patients with endocrinopathies have an estimated sixfold increase in the incidence of SUFE and represent 5% to 8% of patients with the condition. Other factors, such as race, gender, season and geographical location, also contribute to the aetiology.<sup>2</sup>

SUFE is overwhelmingly a disease of adolescents and is not usually encountered in adults. In hypothyroidism, there is a delay in development of the epiphysis and its appearance may be similar to that in Perthes' disease. Untreated hypothyroidism is associated with open growth plates beyond the normal age for closure. However, SUFE has been reported only a few times in the adult with hypothyroidism.<sup>3</sup> We present the case of a 29-year-old man with bilateral SUFE. Autoimmune Hashimoto's thyroiditis was diagnosed during the investigation of this unusual case.

of pain and inability to bear weight for the previous five months. He had consulted a hepatologist for jaundice and abdominal distension three months before his visit to us and, after a biopsy and liver function tests, had been diagnosed as having chronic liver disease secondary to autoimmune hepatitis. His past history suggested normal physical and mental development in early childhood.

On examination he was of moderate build and could not stand independently. Both hips had external rotation deformities of 45° on the left and 30° on the right. Flexion was to 100° and abduction to 10° in both hips. All movements were associated with significant pain and spasm. Radiographs revealed bilateral SUFE (Fig. 1). A technetium bone scan showed increased uptake in both hips but no abnormalities elsewhere. A diagnosis of chronic SUFE was made. This condition in a 29-year-old suggested a significant metabolic or endocrine abnormality. On detailed examination, his weight was 68 kg, height 163 cm and arm span 173 cm. His upper segment measured 77 cm, the lower segment 86 cm, and the body mass index was 25.59 kg/m<sup>2</sup>, the upper limit of normal. He had abdominal distension with hepatomegaly, prominent veins on the anterior abdominal wall and gynaecomastia. The scrotal sacs were poorly developed and his testes measured about 6 ml with a Prader's orchidometer, compared with the normal 15 ml.<sup>4</sup> There were no secondary sexual changes, such as facial, axillary and pubic hair. Haematological investigations showed an elevated

■ A. T. Oommen, MS(Ortho), DNB(Orth), Assistant Professor  
■ V. Madhuri, MS(Ortho), MCh(Ortho), Professor and Head  
Department of Orthopaedics  
■ T. V. Paul, MDMed, DNB(Endocrinology), Assistant Professor  
Department of Endocrinology  
Christian Medical College and Hospital, Vellore 632004, Tamil Nadu, India.

Correspondence should be sent to Dr A. T. Oommen; e-mail: lillyanil@cmcvellore.ac.in

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A 29-year-old man presented in November 2005 with a ten-year history of bilateral hip pain. This had increased during the preceding two years and he had been bedridden because



Fig. 1

Pre-operative radiograph showing bilateral severe slipped upper femoral epiphysis.



Fig. 2

Follow-up radiograph after bilateral *in situ* pinning and valgus intertrochanteric osteotomy on the left side, showing fused epiphyses bilaterally.

thyroid-stimulating hormone at 32.7 µIU/ml (normal 0.3 to 4.5). The thyroxine ( $T_4$ ) level was reduced at 2.43 µg% (normal 4.5 to 12.5). There was significant elevation of the antithyroglobulin and antimicrosomal thyroid antibodies. The total proteins were 9.4 g%. The serum globulin was 4.5 g% with a reversed albumin:globulin ratio. The liver biopsy showed a mixed macronodular and micronodular cirrhosis with moderate activity.

A diagnosis of Hashimoto's autoimmune thyroiditis with hypothyroidism, hypogonadotropic hypogonadism and autoimmune liver disease was made. He was started on an immuno-suppressant (azathioprine), thyroxine, propanolol to prevent portal hypertension, and a diuretic (frusemide).

Bilateral pinning *in situ* using a single cannulated hip screw (ASNIS; Stryker Howmedica, Newbury, United Kingdom) was carried out under general anaesthesia in May 2006. He was immobilised in a hip spica for three months after removal of the sutures. The right physis had closed five months after pinning, and the residual deformity on the left was corrected by a subtrochanteric valgus derotation osteotomy in January 2007. This physis had closed five months later, in June 2007. When last seen in September 2008, he could walk unaided. Both hips had flexion to 110°, abduction to 40° and adduction to 30°. The left side had external rotation to 90° and internal rotation to 20°. The right hip had an external rotation deformity of 20° with a further 70° external rotation. Radiographs showed fusion of both physes (Fig. 2).

## Discussion

SUFE at an unusual age is associated with endocrine abnormalities such as hypothyroidism, panhypopituitarism, hypogonadism, abnormalities of growth hormones, hyperparathyroidism and hypoparathyroidism.<sup>1</sup> In Down's syndrome, SUFE may occur because of the increased incidence of hypothyroidism and hypogonadism. Growth hormone therapy can result in SUFE and in patients with renal osteodystrophy, the management of associated hyperparathyroidism reduces the risk and progression of SUFE.<sup>1</sup>

The presence of immune complexes in the synovial fluid of hips with SUFE has suggested an immune-mediated aetiology<sup>1</sup> and the unusual feature in our case is the open physis due to autoimmune hypothyroidism following normal development in early childhood.

The growth and maturation of cartilage and its subsequent calcification require normal levels of growth and thyroid hormones. In hypothyroidism, there is an abnormal increase in the degeneration of chondrocytes, enhanced mineralisation of matrix and inhibition of ossification.<sup>5</sup> The epiphyseometaepiphyseal junction in an untreated case is a lattice of solidly calcified cartilaginous matrix,<sup>5</sup> and the physis distal to this becomes more vulnerable to shearing.

The incidence of SUFE in India is unknown, but from our experience in a tertiary referral centre we do not see the condition more than once a year. Therefore, in our population, any case should be assumed to have an underlying pathology and investigated accordingly. In spite of hormone therapy and pinning *in situ*, our patient showed no evidence of fusion of the growth plate until five months after operation on the right side and a further eight months on the left. Others have reported one year for fusion of the growth plate with medical management alone.<sup>6</sup>

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