DELAYED SLIPPED CAPITAL FEMORAL EPIPHYSIS AFTER ORIF FOR SUBTROCHANTERIC FEMUR FRACTURE

zied mansi\textsuperscript{1}, mohsen chamakh\textsuperscript{1}, abdelkader tounsi\textsuperscript{1}, Aymen Ben mahmoud\textsuperscript{1}, wajdi chermiti\textsuperscript{2}, ali haggui\textsuperscript{3}, and bacem zaidi\textsuperscript{1}

\textsuperscript{1}Ibn El Jazzar Regional Hospital
\textsuperscript{2}Sahloul University Hospital
\textsuperscript{3}University of Sousse

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INTRODUCTION:
Slipped capital femoral epiphysis (SCFE) is defined as a posterior and inferior slippage of the proximal femoral epiphysis on the metaphysis of the femoral neck. The exact cause of slippage is uncertain and probably multifactorial, including obesity or increased body mass index, retroversion of the proximal femur, and increased physeal obliquity, occasionally associated with endocrine disorders such as hypotestosteronism, hypothyroidism, and hypoestrogenism. It is a rare but serious complication that can occur following orthopedic surgery for proximal femur fractures. We present a case of a 13-year-old male adolescent who developed SCFE on the same hip that underwent ORIF using blade plate for subtrochanteric right femur fracture and We aim to discuss the possible link between the surgical technique used for proximal femur fractures and the delayed onset of SCFE.

CASE HISTORY:
We report the case of 13 yo male adolescent who was a victim of a traffic accident (2021) occurring a left hip subtrochanteric fracture [Figure 1] that was treated bay ORIF using blade plate and achieved an appropriate union in the fracture site[Figure 2]. Six months later, he presented with left side hip pain, limited range of motion, and occasional limping.

METHODS:
The physical examination at presentation revealed limited and painful abduction and internal rotation of the left hip, and radiographs revealed a moderate SCFE (Southwick scale) with a 60° angle, as well as the presence of an opening of the femoral head physis on the same hip that underwent ORIF[Figure 3]. The patient was treated with closed reduction and in situ fixation technique by two 6.5 mm diameter cannulated screw after device removal by the femoral lateral approach incision on the left side[Figure 4].

CONCLUSION AND RESULTS:
At 12-month follow-up, the patient achieved the union and the physis did not displace[Figure 5]. The patient had no hip pain and achieved a full range of motion.

DISCUSSION:
following treatment of a proximal femoral fracture may be caused by inadequate treatment of the fracture. Orthopaedic surgeons should be aware of this unusual complication in order to promptly recognise and treat this complication [3].

Previous reports have shown that the quality of proximal femoral fracture fracture fixation and complications such as malunion, nonunion, varus deformity and avascular necrosis may be associated with SCFE after fixation. Ok and al. reported a case of a 6-year-old boy who developed SCFE after malunion of a subtrochanteric femoral fracture. They recognised the change in the shear force on the epiphyseal plate responsible for the development of SCFE.[6] Li et al. presented two cases, a 12-year-old girl and a 6-year-old girl, who developed SCFE at five and nine months of age, respectively, after screw fixation of a femoral neck fracture. They identified clinical factors such as implant irritation, early return to weight bearing, delayed union or non-union, coxa vara and avascular necrosis as possibly being associated with the development of subsequent slip [4].

It is important to consider malalignment in proximal femoral fractures as a possible cause of SCFE after fixation described by Chinoy and al [3]. They described a 5-year-old case presenting with a diagnosis of SCFE following a femoral neck fracture, which was tightly reduced and fixed with a spica cast. They identified varus deformity after femoral neck fracture as a possible factor associated with SCFE [3].

Our patient was a healthy normal boy with no endocrine or genetic disorder. Furthermore, there was no evidence of SCFE on the x-ray taken at the time of the initial fracture. Thus, in our case, fracture union had been established, and fracture-related complications such as coxa vara secondary to fracture, as the factor in the development of epiphyseal slippage could be ruled out. In our case, anatomical reduction was achieved perioperatively.

Manukaran and Abdul Hamid reported a case of SCFE in a 9-year-old boy 14 months after internal fixation of a femoral neck fracture with cancellous screws. They identified the tip of the implant at the epiphyseal plate as responsible for the slippage [5]. In our case, the subtrochanteric fracture was fixed with blade plate, which was was surgically precontoured. Previous studies have suggested that surgical technique, particularly the use of blade plate, may increase the risk of developing SCFE. The mechanism of the increased risk may be due to the disruption of the proximal femoral physis by the surgical procedure, leading to an alteration in the biomechanics of the hip joint, and it is suggestable using the anatomical proximal femoral plate in pediatrics subtrochanteric fractures[1]. Our case report provides additional evidence of the potential link between delayed-onset SCFE and ORIF for subtrochanteric femur fracture.

CONCLUSION :

After fixation, proximal femoral fractures may result in SCFE. In order to lower the risk of SCFE, it is crucial to prevent it with the right implants and to assess endocrine profiles after fractures. After a proximal femoral fracture, achieving anatomic reduction and alignment is a critical step in preventing complications like SCFE.

DECLARATIONS :

The authors confirm that they have no conflicts of interest associated with this publication.

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Parental Consent for Minor :

Written informed consent was obtained from the patient’s parents/legal guardian for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

REFERENCES :
Figure 1: left subtrochanteric fracture
Figure 2: left subtrochanteric fracture reduced and fixed with a blade plate
Figure 3: unilateral moderate SCFE (Southwick scale) with a 60° angle following subtrochanteric left femur fracture, which was fixed by blade plate
Figure 4: Intraoperative X-ray showing reduction and fixation of the SCFE with two 6.5 mm diameter cannulated screw after device removal
Figure 5: radiograph 6 months post-operatively showing the union of the physis that has not been displaced