



# Arthroscopic Treatment of Femoroacetabular Impingement in Slipped Capital Femoral Epiphysiolysis: A Case Report\*

## *Tratamento artroscópico do impacto femoroacetabular na epifisiólise capital femoral proximal: Relato de caso*

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### Abstract

#### Keywords

- ▶ arthroscopy
- ▶ hip
- ▶ epiphyses, slipped
- ▶ femoroacetabular impingement

### Resumo

#### Palavras-chave

- ▶ artroscopia
- ▶ quadril
- ▶ epífise deslocada
- ▶ impacto femoroacetabular

Slipped capital femoral epiphysiolysis (SCFE) may result in femoroacetabular impingement (FAI) of the hip in up to one third of the cases. Residual deformity of the cam-type, or “pistol-grip”, is associated with chondrolabral injury, resulting in pain, functional disability, and early osteoarthritis. The arthroscopic treatment with osteochondroplasty proved to be beneficial in a selected case of FAI secondary to SCFE.

A epifisiólise capital femoral proximal (ECFP) pode resultar em impacto femoroacetabular (IFA) do quadril em até um terço dos casos. A deformidade residual em came ou “cabo de pistola” está associada a lesão condrolabral, resultando em dor, incapacidade funcional, e osteoartrose precoce. O tratamento artroscópico com osteocondroplastia mostrou-se benéfico em um caso selecionado de IFA secundário a ECFP.

### Introduction

Slipped capital femoral epiphysiolysis (SCFE) is the most common adolescent hip disorder, with a reported incidence

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of 10.8 for every 100 thousand inhabitants. Bilaterality can occur in up to 20% of the cases.<sup>1</sup> Mechanical factors such as obesity, femoral retroversion, and relative vertical orientation of the proximal femoral physis have been associated with this etiology.<sup>2</sup>

The proximal femoral neck moves anterolaterally at the level of the physis over the femoral head, which remains inside the acetabulum. This deformity leads to a prominence in the anterolateral aspect of the cephalocervical junction and an attitude in external rotation of the proximal femur. The patients may subsequently develop a “pistol-grip” deformity close to the femoral head, also called “queilo” by some authors.<sup>3</sup> This deformity can be improved by remodeling; however, such potential is limited by the fixation in situ, which compromises physeal growth. In addition, SCFE occurs in an age group in which the ability to compensate for residual deformities by remodeling is no longer possible.

Up to one third of the patients diagnosed with SCFE have persistent pain and/or femoroacetabular impingement (FAI) resulting from the deformity.<sup>4</sup> Residual prominence (“pistol-grip” deformity) and relative retroversion of the femoral head were defined as the cause of cam-type FAI, with worse long-term clinical and radiographic results. An important mark of this deformity is the reduced or absent offset between the femoral head and the neck, which can be radiographically graded.

Residual prominence at the head-neck junction protrudes into the acetabular ridge, generating stress at the chondrolabral junction, resulting in the separation of the labrum from the articular cartilage, which is a precursor of irreversible chondral injury. This lesion begins shortly after sliding in the SCFE and usually progresses over time, leading to deterioration of the hip at an early age.<sup>5</sup>

There is evidence in the literature to support arthroscopic osteochondroplasty of the femoral neck in the treatment of symptomatic FAI secondary to SCFE, with encouraging results,<sup>6,7</sup> and an early approach is suggested right after the slide in order to prevent irreversible progression with worse long-term results.<sup>7</sup>

## Case Report

Female patient, 15 years old, without comorbidities, in the 2nd postoperative year of bilateral in situ fixation of the femoral head by SCFE. She reported pain and limited movement of the left hip that worsened with support.

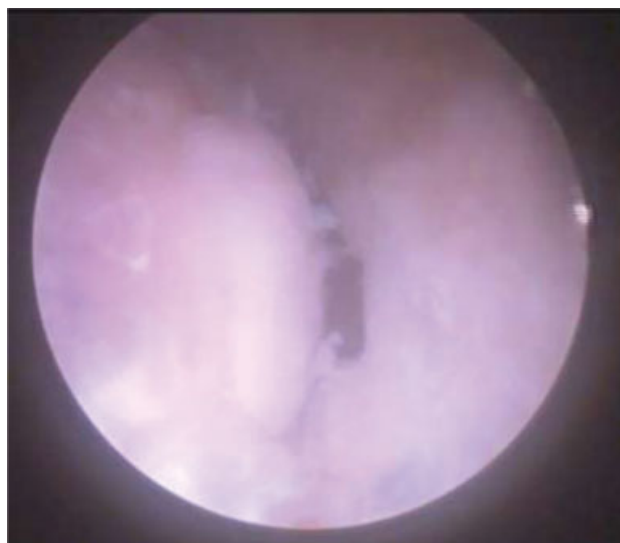
During the inspection, an attitude of external rotation of the left lower limb was observed, most evident during walking. The patient presented a slight limp in the left lower limb during gait, which was associated with pain in the hip. There was no sign of Trendelenburg.

Upon physical examination, she had an important limitation of internal rotation of the left hip associated with pain during the maneuver. The Drennan sign was observed on the left during the examination. The patient had no neurovascular changes in the lower limbs. Preserved muscle strength was verified in both lower limbs.

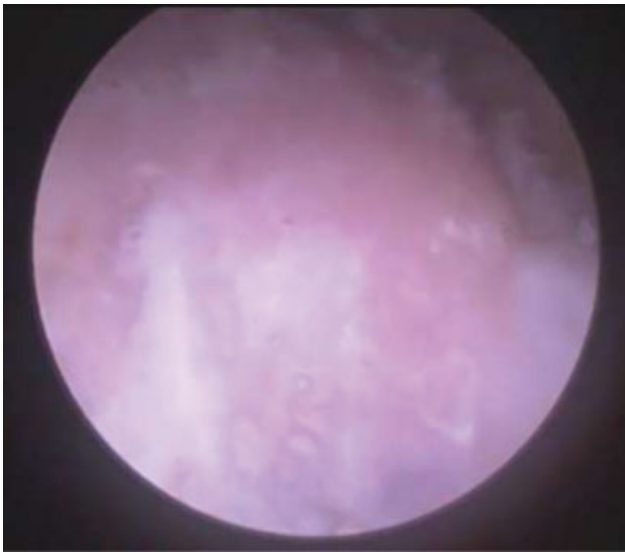


**Fig. 1** Anteroposterior radiographs of the pelvis (above) and in Dunn profile of the hips (below) showing deformity in the anterolateral region of the left femoral neck compatible with cam-type impingement.

On anteroposterior (AP) radiographs of the pelvis and profile radiographs of the hip (→ **Figure 1**), epiphysiolysis of the left hip was observed, with significant anterolateral prominence in the head-neck transition associated with



**Fig. 2** Chondrolabral lesion observed during arthroscopy.



**Fig. 3** Cam-type deformity in the head-neck transition.

reduced offset. The Trethowan signal was present. The growth of the physis was already closed.

The anamnesis, the physical examination, and the radiographs were compatible with cam-type FAI secondary to epiphysiolysis. Due to the symptomatic pain associated with joint blockage, the recommended treatment was osteochondroplasty via arthroscopy.



**Fig. 4** Anteroposterior radiograph (above) and in Lauenstein profile (below) of the pelvis in the postoperative period showing the correction of the deformity.

During the arthroscopy, a chondrolabral lesion was found in the anterolateral ridge of the acetabulum (► **Figure 2**), compatible with cam-type FAI (► **Figure 3**), which was confirmed during the dynamic evaluation in the intraoperative period. Labrum debridement and osteochondroplasty of the femoral neck and acetabular ridge were performed, with the aid of fluoroscopy to control the head-neck offset. After the procedure, the dynamic assessment no longer showed any impingement. Postoperative radiographs showed correction of the prominence responsible for the impingement (► **Figure 4**).

Rehabilitation was started on the first postoperative day with assisted passive movement, active movement and walking with load restriction on the operated limb for two weeks.

In the first postoperative month, the patient already had significant improvement in pain and gait. There was an important gain in the internal rotation of the left hip and in the overall range of motion. At the third month, she walked without complaints of pain. At the sixth month, she returned to sports activities, being totally asymptomatic.

## Discussion

The association between SCFE, symptomatic FAI and chondrolabral injury is currently well-established.<sup>8</sup> Even after epiphyseal stabilization, specific cases of SCFE may be suitable for arthroscopic treatment, which consists of an emerging technique with few long-term follow-ups.<sup>9</sup> Some studies suggest that arthroscopy can be applied even in severe epiphysiolysis deformities.<sup>10</sup>

Cheilectomy of the hip is a well-suited procedure for patients aged between 10 and 14 years with a feeling of joint blockage secondary to pathologies of the hip in childhood and adolescence, consisting of a relatively simple technique, and free from major complications, which can delay the degenerative process of the joint for up to 10 to 15 years.<sup>3</sup>

The selection of patients who can benefit from arthroscopy depends on femoral morphology. The precise indication has not yet been established, but osteochondroplasty may be beneficial in cases of SCFE associated with a cam-type impingement. If the areas of impingement of the deformity are accessible to an arthroscopic approach, the surgeon should consider it instead of an open approach. However, the mechanical effect of different degrees of retroversion of the femoral neck, acetabular depth and orientation, and epiphyseal displacement must be considered before indicating an arthroscopic approach.<sup>11</sup>

## Conflict of Interests

The authors have no conflict of interests to declare.

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