



## RESEARCH ARTICLE

# Sociodemographic, Therapeutic and Functional Aspects of Upper Femoral Epiphyseolysis in Ouagadougou: A Preliminary Study of 10 Cases

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## Abstract

**Introduction:** Slipped capital femoral epiphysis (SCE) is a pathology affecting older children and adolescents at the onset of puberty, during the growth acceleration phase. Several techniques have been described for the management of this pathology. The aim of our work is to describe the sociodemographic and therapeutic aspects and to evaluate the functional results.

**Patients and methods:** This was a retrospective descriptive study based on eight available patient files over a four-year period. Functional results were assessed using the Postel and Merle d'Aubigné (PMA) score, with a mean follow-up of 34 months.

**Results:** The mean age was 12 years and 6 months, with a male predominance (06 cases). Five patients (62.65%) had a normal body mass index. Four patients (66.66%) had unilateral left-sided EFS, while two had bilateral EFS. Five patients had chronic EFS, two had an acute form with a chronic background and only one had an acute form. Five patients had average stage II slippage. The mean time to CEP was 19.4 days. *In situ* fixation by screwing or pinning was used in five patients (62%), and functional evaluation was satisfactory, with a mean PMA score of 15.12%.

**Conclusion:** The prognosis of EFS remains influenced by two parameters, early diagnosis and adequate ECP.

## Keywords

Upper femoral epiphysiolyis, Results, Hip

## Introduction

Superior femoral epiphysiolyis is the most common hip disorder of adolescence. It is defined by acute or progressive non-traumatic slippage of the superior femoral epiphyseal nucleus posteriorly, inferiorly and medially on the metaphysis through the pathological cervicocephalic conjugating cartilage (CC) [1]. Its incidence continues to rise worldwide, with 0.2/100,000 inhabitants in eastern Japan and 10/100,000 in the USA [2]. The aim of treatment is to halt slippage, accelerate physeal fusion and limit arthrogenic sequelae, especially osteonecrosis of the femoral head and laminar coxitis [2].

Several techniques have been described for the management of this pathology. In this study, we set out to describe the therapeutic aspects and assess the functional results of femoral epiphysiolyis treated by pinning versus percutaneous screw fixation in Ouagadougou.

## Materials and Method

This was a four-year retrospective descriptive study, from January 1, 2017 to December 31, 2020. All patients with upper femoral epiphysiolyis (EFS) treated by simple pinning or percutaneous screw fixation with a postoperative follow-up of at least

six (6) months were included. The diagnosis of EFS was established on clinical and paraclinical grounds following a consultation. X-rays of the pelvis and profile enabled us to classify the degree of slippage according to Carlloz. Follow-up was clinical and paraclinical, enabling us to assess post-treatment evolution with a view to detecting and treating complications. On each patient's pelvic X-ray, we determined Klein's line (Figure 1), which is the tangent to the upper edge of the neck, no longer passing through the upper edge of the superior ossification nucleus. On the strict profile X-ray, we traced the SOUTHWICH angle (Figure 2).



Figure 1: EFS acute right.



Figure 2: Southwich angle plot.

Functional assessment of our patients was based on the Postel Merle Aubigné (PMA) score. The surgical technique consisted in placing the patient on an orthopedic table under scopic control from the front and in profile. Kirschner wires and 6.5 cancellous bone screws were used.

## Results

The mean age was 12 years and 6 months, with a male predominance (06 cases). Five patients (62.65%) had a normal body mass index. The left unilateral form was noted in four patients (66.66%), two patients presented a bilateral EFS. Our patients underwent surgery between D2 and D90, with an average operative time of 19.37 days. General anaesthesia was used in all patients. Five patients benefited from *in situ* fixation, two from orthopedic table reduction and one from bonded traction. After the patient and his family had complied with the prescription for the procedure, he was taken to the operating room. Two types of material were used to fix the lesions. Six lesions were stabilized with Kirschner wires and two with cannulated screws. All slips classified as stage 1 were fixed *in situ*. Three patients benefited from preventive treatment of the contralateral hip.

The immediate evolution was favorable, with no immediate or intraoperative complications noted in any of our patients. However, we noted two cases of coxarthrosis at a mean follow-up of 23 months and one case of laminar coxitis at a follow-up of 7 months in patients with grade II and grade III EFS. According to the Postel and Merle d'Aubigné score, the results were generally satisfactory. Table 1 shows the distribution of patients according to functional results and stage of slippage.

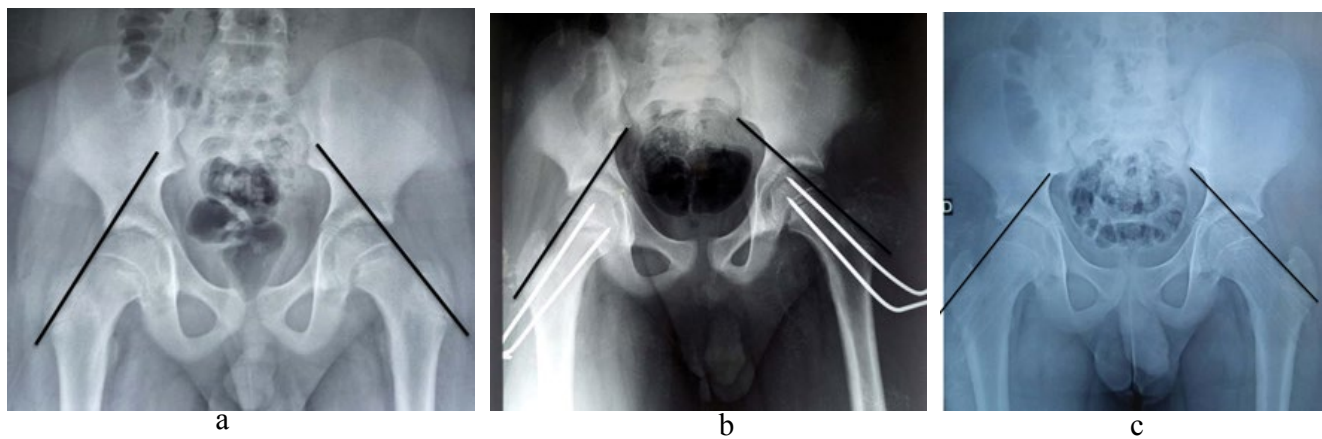
Our functional results were good to excellent in 62.5% of cases, according to the Postel and Merle d'Aubigné score.

## Discussion

The mean time to treatment was 19.37 days (02-90 days). As EFS is a surgical emergency, especially in its acute and unstable form, early and appropriate management is essential to ensure a good functional prognosis for the hip. Violas, [3] reported a delay of

Table 1: Distribution according to functional results and slip stage.

	Stage 1	Stage 2	Stage 3
Excellent	1	1	0
Very good	1	1	0
Good	0	1	0
Passable	0	2	0
Poor	0	0	0
Wrong	0	0	1



**Figure 3:** (a) Chronic bilateral unstable EFS; (b) Pin fixation; (c) Complete fusion of growth plate at 8 months post-op.

7 days. This long delay in surgical management in our series is linked to the unfavorable socio-economic conditions of some parents, as well as the frequent failure of the image intensifier and its absence from the main pediatric university hospital during our study period.

75% (6 cases) of our patients were treated with pins (Figure 3) and the remaining 25% (2 cases) with screws. Arroson [4], said that FIS with a single screw is preferable to multiple pins, as it stops the progression of slippage and achieves physal fusion in 92% of cases. In 2014, Nectoux [5], carried out a study on the outcome of upper femoral epiphysiolysis after *in situ* screw fixation at a mean follow-up of 11 years, involving 222 cases; this was a multicenter study and the main material used in this series was screws. Unlike other authors, such as Boero, et al. [6] and Seller, et al. [7], who reported the use of pins only in their study? The number of pins used ranged from two to four. Only Boero, et al. [6] used five wires in some of his patients. In our study, the majority of our cases were fixed with two wires, except for one patient who benefited from the use of three wires. This patient had severe stage III slippage. With regard to the configuration of the pin assembly, we used a roughly parallel assembly, like that used by Boero, et al. [6]. By contrast, Seller, et al. [7] used a bouquet configuration with three wires converging at the same cephalic point. The high percentage of wire use in our study may be explained by the accessibility of wires in our departments, their relatively low cost and ease of use. Preventive treatment of the contralateral hip versus its regular monitoring remains a controversial issue. In our series, preventive ECP on the unaffected side was performed in three patients, a rate of (37.5%). One case was treated by screw fixation and the other two by pinning. Stasikelis, et al. [8] determined a method for assessing pelvic skeletal maturity by modifying the Oxford score. The risk of developing a slip on the side of the healthy hip was less than 4% when the triradiate cartilage was closed, zero when the Risser score was 1 or more, and zero when

the modified Oxford score was greater than 22. All children who benefited from preventive treatment had a Risser score greater than 1, and the modified Oxford score was 17, 18 and 20. The study by Bernati, et al. [9] provided a number of arguments. According to them, preventive treatment is carried out systematically in cases where close monitoring is contraindicated, and is recommended when the patient is very young in order to avoid limb-length inequality, and when EFS is non-idiopathic. We believe that Bernati's criteria remain the best for preventive fixation of the healthy hip. The complication rate in our series was 37.5%. The evolution of EFS depends on several parameters. Exceptionally, it can also lead to stabilization. Displacement stops when CC welding is complete. We recorded three types of complication: Two coxarthroses and one laminar coxitis. However, we did not find any complications such as intra-articular migration of pins or screws, or infections of the osteosynthesis material. All our patients were assessed using the POSTEL MERLE d'AUBIGNE (PMA) score. The mean PAM score was 15.12 (12 and 18). Overall, we found 50% good and very good results, 12.5% excellent results and 25% fair results. Our results are well below those reported by Violas [3], and Melinda, et al. [10], who found 80% and 93%, but close to those of Falikou [11], and Lawan, et al. [12], who found 62% and 67%. This relatively low rate of our results could be explained by the small size of our sample, the long delay in treatment and the delay in diagnosis. Overall, our results are very satisfactory.

## Conclusion

Superior femoral epiphysiolysis remains the first etiology to evoke in a large child or adolescent presenting with non-febrile lameness, alone or associated with hip or provoked knee pain. Consensus is far from being reached on the therapeutic attitudes to adopt to minimize the unfavorable evolution of EFS. In a developing country like Burkina Faso (Ouagadougou), treatment of this pathology by skewering must be an integral part of the therapeutic arsenal.

## Declaration for Human Participants

This study complies with the Helsinki ethical principles for medical research involving human subjects. We have obtained the informed consent of all our patients and the authorization of the competent institutional body, which is the medical directorate.

## Conflict of Interest

The authors have declared no conflict of interest. Data availability: All data are included in the content of the article.

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